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INDUSTRIAL HEALTH AND NATIONAL DEFENSE

LEVERETT D. BRISTOL, M.D., DR.P.H.

NEW YORK

An adequate national defense requires a vigorous health offensive! Stimulated by the launching of the nation's defense program, the organized medical and public health professions have been quick to realize the importance of the contributions which they can make to health preparedness. The mobilization of the medical profession for any emergency that may arise has been successfully inaugurated with the appointment of a National Committee on Medical Preparedness by the American Medical Association.

Man power is now the greatest need both of industrial production and of military defense. Adequate man power is dependent on the highest type of mental and physical fitness; nor should the health of women workers be forgotten in these times, in view of their important contributions to industrial production and operation and their possible substitution for men in times of serious national emergency. The speed-up of production and manufacture, the development of new material and methods, the increased employment of new workers unused to the hazards of industry will require new industrial health routines and regulations, more intensive study and research in the field of occupational diseases and industrial poisons and the extension and improvement of all health and safety education. To speed the work but to spare the worker should be our aim!

GENERAL HEALTH PREPAREDNESS

Industrial health preparedness in the United States is only one phase of a general health preparedness program, although from the standpoint of national defense industrial health undoubtedly should command first attention, since it involves our adult civilian population of productive workers and the enlisted land, sea and air forces of the country, on all of which successful national defense in times of emergency must depend. The first essential in our countrywide public health program during these times of preparation for adequate national defense is a thorough scanning of our organized medical and health machinery to be sure that important matters of coordination and administration are provided and that there are no gaps or weaknesses in federal, state, county or city health administration or in public and private medical facilities. Moreover, during times of temporary national emergency, centralization of medical and public health authority is required.

Read before the International Society of Medical Health Officers, Detroit, Oct. 7, 1940.

INDUSTRIAL HEALTH

During the World War of twenty-five years ago I had the privilege of serving as commissioner of health of one of the New England states. Our work was closely integrated with that of the federal Public Health Service during the war period. In fact, the Surgeon General of the Public Health Service suggested that all state health officers remain at their posts in order to cooperate in the federal wartime health program. The one thing I do not remember as an important part of our federal-state program at that time was industrial health or industrial medicine. The fact is that private industrial medicine in this country was then only in "swaddling clothes" and one or two industrial hygiene units in state governments had only just been born. The Division of Industrial Hygiene of the United States Public Health Service and the Section on Industrial Hygiene of the American Public Health Association are only a little over 25 years old, having been created in 1914. The American Association of Industrial Physicians and Surgeons also is but 25 years old, while the American Industrial Hygiene Association held its first annual meeting this past June. It has been only during the past three or four years that bureaus of industrial hygiene have been rapidly extended in health departments of various states and cities, under the excellent leadership of the United States Public Health Service. Only since 1937 has the Council on Industrial Health of the American Medical Association been operative in cooperation with committees or activities on industrial health in thirty-four state medical societies, most of which have been organized during the past three years. In other words, the whole specialty of industrial health as we know it in this country is at the present time only a little over 25 years old and has developed almost entirely since the World War.

As a part of a national defense program, it becomes evident from the foregoing facts that industrial physicians and industrial hygienists of this country have little in the way of precedent or wartime experience on which to base their efforts, unless it be, to some extent, the recruiting experience and a few engineering experiences during the World War. As a matter of record, it may safely be predicted that the present national preparedness program will be to industrial medicine and industrial hygiene in the United States what the World War was to the greater stimulation of interest and plans in the field of social hygiene. It is particularly to be hoped that the present plans for national defense will result in more active cooperation between industrial medical departments and local and state health departments and medical societies. One concrete achievement of such coordinated efforts might be a much needed national plan for standardized recording and reporting of industrial morbidity and mortality, particularly of occupational diseases.

PRIVATE INDUSTRIAL MEDICINE

One of the most important problems common to industrial medicine and military medicine is that of traumatic surgery. Industrial medicine's so-called parents might be said to have been (1) traumatic injuries of workers and (2) workmen's compensation laws. In any national preparedness program much should be done to increase the facilities for teaching traumatic surgery in our medical schools and in developing postgraduate instruction for practicing physicians through county and state medical societies and military organizations. In this connection, much of the leadership in promoting and teaching traumatic surgery might be available from those industrial surgeons who even during peace time have become experts in the fields of traumatic surgery and first aid treatment of accidents and infections.

Industrial medicine, even in a national defense program, must be preventive and educational as well as reparative, reconstructive and curative. It must concern itself with nonoccupational as well as occupational diseases. Industrial physicians will have important parts to play in the national defense program from the standpoints both of (*a*) the physical and mental fitness of civilian workers and enlisted forces and of (*b*) the safety and healthfulness of working and training environments.

During the present national emergency, professional facilities must be made available not only for a successful medicomilitary program but also for the continuity of adequate medical care for the civilian working population. In the latter connection it should be stressed that much of the load of responsibility will continue to be carried by individual practicing physicians. The great bulk of industrial medical work is now being carried on by private physicians on a part time basis. One of the first essentials, therefore, in an industrial health preparedness program is to determine all physicians in the United States who are qualified for industrial medical service, with some indication of their experience and special fields, such as administration, physical examinations, first aid, industrial surgery, industrial toxicology and industrial health education.

The possible availability of properly qualified full time industrial physicians and surgeons for special assignments in the federal service should be given careful attention while at the same time acknowledging the fact that as a group the greatest usefulness of trained industrial physicians in a national emergency may be in their remaining at their posts in private industrial organizations. The inauguration of a plan for state and regional consultants on industrial health would be desirable in the interest of better organization and coordination. Such consultants, during the preparedness emergency, might be attached to the United States Public Health Service. Their chief function would be as consultants and coordinators working in cooperation with (*a*) state and local health officers, (*b*) state and county medical society committees on industrial health, and (*c*) industrial medical departments.

The Council on Industrial Health of the American Medical Association at its last meeting expressed its willingness to assist in the development of intensive training on industrial health methods for full time and part time industrial physicians, through its organization of committees in state medical societies. The Council already has acquired information on all major medical agencies interested in employee health and on the available facilities for undergraduate and postgraduate industrial medical training in the educational institutions of the United States, as well as other data of potential value in an industrial health preparedness program as a part of national defense. A general statement of medical relationships in industry and of industrial medical education appeared in a special industrial health issue of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION last February.[1] Speaking as a member of the Council, which is a standing committee of the Board of Trustees of the American Medical Association, we would welcome the cooperation of the International Society of Medical Health Officers in all matters pertaining to the advance of industrial health in the United States.

OBJECTIVES OF INDUSTRIAL AND MILITARY MEDICINE

The basic objectives of both industrial medicine and military medicine are much the same, namely:

1. To ascertain, by examination, the fitness of individuals for civilian work or military service, and to place individuals in activities consonant with their physical and mental assets and liabilities.
2. To maintain and improve the health and efficiency of those already employed or in government service.
3. To educate the worker or the enlisted man on matters pertaining to personal hygiene.
4. To reduce lost time and absenteeism from industrial occupation or military duty because of illness or injury.

To reach these objectives of either industrial or military medicine a definite plan or program must be formulated under suitable medical direction, with the employment of qualified physicians, surgeons, nurses and other specialists and technicians as may be needed. Medical offices and adequate emergency, dispensary and hospital facilities are essential. Suitable physical examination and medical records are necessary. Medical supervision also should include all matters of general sanitation and environmental hygiene, with the assistance of specialists, such as engineers and chemists, as may be required.

PHYSICAL EXAMINATIONS

Of primary importance among the objectives common to industrial and military medicine are physical examinations. The scope or extent of preplacement examinations must be based largely on the character and general conditions and needs of the industry or the military assignment. Such examinations may vary all the way from a very brief, superficial physical inspection to a detailed medical examination of an hour or more. We shall have to strike some midground as far as the average examination is concerned. We certainly want to make examinations that are worth something; on the other hand, there is a limit that may be reached as to their practicability from the standpoints of time and expense. Physical tests of employees during the national defense emergency might possibly be based on requirements and record forms previously agreed on jointly by military and industrial authorities. This would be the means of saving time and in the interest of standardized procedures and records in the proper placement of workers in civilian or military positions.

The purpose of medical examinations should not be to keep people out of work or out of military service but rather to know what the actual conditions are and to make certain that the individual does not take up a job for which he is not fitted. Time will not permit of a detailed account of the various types of physical

1. Industrial Health, J. A. M. A. **114**: 573 (Feb. 17) 1940.

examination procedures and forms of examination classifications or of acceptance and placement standards and causes for rejection. These subjects have been extensively covered from time to time in pamphlets and bulletins of various voluntary and government organizations and are available to those interested in the subject of physical examinations.

As interest grows in the subject of mental hygiene, which underlies the whole realm of physical health and safety, more and more attention must be given to mental and nervous system examinations in connection with routine physical appraisals of civil and military groups. Bad mental hygiene of individuals and masses to a large degree is responsible for much industrial unrest and even for lowered morale in armed forces. To obviate this the promotion of a sound program of mental health in industry and among enlisted forces is the only alternative; this, in turn, can be built only on knowledge obtained through satisfactory mental inventories of employee or recruit groups.

Of all measures of industrial health preparedness from the standpoint of national defense there is none more important than the periodic health examination of individuals in working groups. Such examinations should serve not only (*a*) to guard the health of civilian employees in industry, particularly those in the so-called war industries, from excessive fatigue and the possible ill results of speed, pressure and special hazards associated with national preparedness but also (*b*) to maintain a high level of physical and mental fitness in those private industrial "reservoirs" which at any time might have to be drawn on for government service. Business organizations may thus contribute to national defense by encouraging such health examinations among their employees. Physical examinations, both initial and periodic, fall short of their full value unless followed up with programs for the control and correction of incipient diseases and impairments which are found. Moreover, these examinations, above all, should be considered as important educative experiences.

PUBLIC INDUSTRIAL HYGIENE

Prior to 1936 there were in the United States only five state departments of health and two or three state departments of labor conducting industrial hygiene activities, and even these activities were of limited nature. As of 1940, a total of thirty-nine state and local industrial hygiene units have been established in twenty-nine states and two territories, mostly in departments of health. Some of these are of very recent creation and have only skeleton organizations. There is great need that these be strengthened as rapidly as possible as a part of the national industrial health preparedness program. Moreover, additional industrial hygiene units should be organized without delay in the remaining states and territories and additional local governments, particularly of the larger cities. Steps should be taken to make possible the financing of these industrial hygiene units by state and local appropriations. At present nearly 80 per cent of funds budgeted for public industrial hygiene is contributed by the federal government. During the present emergency, additional funds should be provided to the Public Health Service to train additional industrial hygiene personnel. Care should be taken to emphasize that such industrial hygiene activities are properly the function of health departments and to discourage steps taken in a few localities to develop such essential health services in agencies other than health departments.

CONCLUSION

It may be stated that industrial physicians and industrial hygienists, like medical public health officers, are ready and willing to serve their country in this preparedness emergency. Industrial health work should be a strong arm in national defense, particularly in the preservation of expert workers and assisting in the development of additional skilled workers. Reducing lost time due to occupational and nonoccupational illness and accidents and cutting down excessive exposure to injurious materials are part of the industrial health program which will be conducive to maximum national effectiveness and production. It is particularly necessary that studies be made to determine unfavorable environmental factors in the production of war equipment and munitions. The business employer or the governmental unit that considers reducing its industrial health program at this time, because of what at the moment may seem to be more important activities, is most unwise. As a matter of fact, the needs of national defense require a strengthening and broadening of the entire industrial health program all along the line from private industry to local, state and federal jurisdictions. In this significant period of rearmament, during which our chief defense will be our industrial skill, let us be sure that we place first on our list the health and safety conservation of our industrial workers.

195 Broadway.

OPPORTUNITIES FOR PHYSICIANS IN INDUSTRY

THOMAS L. SHIPMAN, M.D.

LYNN, MASS.

From the beginning let it be remembered that this paper is not concerned primarily with "opportunities for industrial physicians." I shall principally consider the opportunities which await the rank and file physician, the general practitioner, in his contact with industry. Let it also be remembered that no facts or percentages which have been gathered in the many studies in this field can be regarded as strictly accurate; no specific figures exist, and it is possible to regard percentages given as indicating only general trends. What is this "industry" that is discussed so casually? Industry is composed of approximately 18 or 20 million human beings who are scattered in groups of various sizes throughout the length and breadth of the country. These individuals are engaged in every conceivable type of occupation and they are working in every conceivable environment. The Council on Industrial Health has listed 241 establishments which employ more than 2,500 men and women, and these larger establishments employ only 10 or 11 per cent of our total 18 or 20 million workers. Sixty-two per cent of this enormous number of individuals are working together in little groups of 500 or less. What sort of medical care are these people getting at the present time? According to the American Medical Directory there are approximately 1,400 or 1,500 physicians who either limit their work to the industrial field or who otherwise regard it as their special interest. The fact becomes at once apparent that the majority of American industrial workers receive medical care from physicians whose interest in this industrial work is, to say the least, secondary.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

The physicians serving industry may be divided into three broad classifications. In the first group are full-time industrial physicians, some of them actively engaged as plant physicians, some working with insurance companies, others who regard themselves as consultants, but all of them choosing to consider industrial medicine or surgery, or both, as their particular specialty. The second group includes doctors who serve industry on a part-time basis. Ordinarily these are doctors with private practices of their own in the field of general medicine or surgery. They have, however, definite understanding and interest in the medical problems in industry, and they ordinarily have some sort of a working agreement with one or more particular industrial groups. I know of one man who could be regarded as a good example of this type: he is the works physician for a fairly large industrial plant during the morning but in the afternoon, unlike the leopard, he does change his spots and emerges as a pediatrician. So far he has refused to confess to me which he regards as his vocation and which his avocation.

In the third category must be included almost all the remaining doctors in the country. Today there are but few doctors who do not occasionally encounter problems which in one way or another should be classified as industrial. Unfortunately the industrial connection in these problems frequently goes unrecognized; but it is possible that one patient's continued headaches result not from chronic sinus trouble or eyestrain but from a mild and repeated exposure to carbon tetrachloride. How about the overworked executive in an industrial concern? If the family physician who is advising this man to take things easy would cooperate with the plant physician he would have the satisfaction of knowing that his suggestions would be carried out. How about that obscure case of eczema which seems to be defying both diagnosis and treatment? The consideration of the substances with which the man works is most certainly of prime importance, of just as great importance as arranging for changes in the type of work which a girl does in the early months of her pregnancy. So many of the general practitioners throughout the country blindly close their eyes to the possibilities of cooperating with industry that they really represent a greater problem than the unhappy few who admittedly are ready to put the blame for every disorder on the patient's work.

That this state of affairs should exist is hardly to be wondered at if one thinks for a moment of the training which the average physician receives in matters pertaining to industrial medicine. In the academic year just closed fifty-two medical schools were listed as providing required instruction in industrial hygiene. On the average, from four to five hours of lectures is devoted to this work and less than half of these schools provide any field trips, although many of them do require that the students should prepare some sort of a sanitary survey. Twelve schools were listed as providing elective or postgraduate courses in industrial hygiene and nine other universities are equipped to provide advanced instruction in this field. Fortunately, this list is growing each year; ten and fifteen years ago, however, the list was painfully brief. This means of course that, except for recent graduates of these fifty-two medical schools, an enormous number of doctors have never received any form of instruction whatever relating to industrial matters. As I look back on my own exposure to industrial hygiene in medical school I realize how completely it failed to place the specialty of industrial medicine before the students as an attractive possibility for a future career. It was much like being served a plate of cold unseasoned spinach in a restaurant famous for the elegance of its cuisine. Industry and the medical schools must get together if the students are to see the field of industrial medicine in its proper perspective. One can even visualize the time when some forward looking hospital will make arrangements with an industry whereby the interns will actually spend a specified time working in and for that industry.

The existing educational institutions can take care of training well equipped young men prepared for full-time work in industry at the present rate of demand. Up to the present, however, that demand has not been nearly large enough, and there are even now large industrial concerns which seem to be perfectly satisfied with second rate medical care for their employees. I know of one industrial plant, employing approximately 14,000 men, where the medical staff consists of one full-time physician. Preemployment examinations in this plant are done by a man who really started as a first aid worker; he told me rather proudly that he could do over 300 physical examinations a day! A situation of this sort certainly seems to be out of step with the general trend. According to the National Industrial Conference Board, the per capita cost for medical care in industry between 1915 and 1938 rose in almost a steady curve from 88 cents to $6.15. I cannot feel that industry has become so paternalistic and altruistic that it would continue such a policy without expecting something in the way of return on that investment.

While on the subject of finance one should not attempt to dodge the issue that in the budget of any medical department in industry salaries probably represent the largest item. It is not too difficult to arrive at a wage rate for a nurse or x-ray technician which will correspond reasonably well with the general level existing in the community. As to how much a full-time physician in industry is worth, there seems to be a decided lack of unanimity. If a full-time physician in industry contents himself with bandaging fingers and dispensing pills, he probably is not worth much to that industry, but if he is willing to tackle his job with the same enthusiasm, the same level of intelligence and healthy curiosity shown by the specialists in any other line, his financial reward should be in proportion. Industry must prepare to pay for a specialist if it wishes the advice and services of a specialist. If industry pays for a finger bandager or a pill pusher, that is just what industry will get.

To the operator of the small industry the establishment of a high powered medical department with a full-time physician is obviously out of the question. How is the manager of the small concern to provide adequate medical care for his employees without a disastrous financial outlay? As I see it, there are two solutions to this problem: in the first place, the services of a true industrial physician could be shared with other concerns. This can be and has been done with great success, and I need only refer the unbeliever to the experience of Dr. Frank Griffin in Toronto as reported in the *Canadian Public Health Journal* for November 1939. Here one can read how one physician was able to take over the medical care in several small plants, do the physical examinations, arrange for nursing service and oversee the general plant hygiene. I know of several situations in this country where a similar arrangement is in operation. The other solution which can be used in

any community, regardless of its size, is to make use of the general practitioner who is already on the job. Almost all industrial concerns, especially the small ones, seem to have particular physicians on whom they call when emergencies arise. It may be that the physician called is the only one in town. The point which I wish to emphasize is that in far too many cases the poor physician is not consulted until after the accident has occurred. I have no desire to turn every doctor into a safety engineer; nevertheless what a superior arrangement it would be for all concerned if that small industry and the doctor could get together on a plan for regular medical supervision of all matters pertaining to the health of the employees; let them start regular preemployment examinations and, even better, periodic examinations. Details of this plan would, of course, have to be adapted to the particular circumstances. It might mean one morning or part of a morning a week for physical examinations and one morning every month or so for a general plant inspection. I am sure that even a small industry would reap a generous return from any money expended in this direction. Here, I feel, lies the real opportunity for physicians in industry. Here lies the way of bringing improved medical care to the greatest number of individuals.

Obviously an industry must exercise a certain amount of judgment in naming the doctor to carry out a program of this sort. I am convinced that the majority of general practitioners who are honest would welcome a closer intimacy with industry. They will produce the argument, however, that they have no training in industrial work and would not have any idea how to go about it. Already twenty-nine states in their state governments have set up departments which are interested primarily in industrial hygiene. The state medical associations are a jump ahead and thirty-four of these societies now have committees on industrial health. These various groups are continually increasing the scope of their activities as well as increasing in number. These are the groups that stand ready to assist the general practitioner as he embarks into the somewhat bewildering and complex field of industrial medicine. Of course there are opportunities for physicians in industry. They exist in nearly every consulting room in the country. They exist in nearly every industry in the country, large or small. They exist somewhere in the family life of the majority of the people in this country. They await only recognition, but they must be recognized jointly by industry and by the medical profession. It can be only when these two groups join hands that these opportunities can be fully realized. A lot of missionary work and a lot of pioneer work remain to be done.

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ABSTRACT OF DISCUSSION

DR. M. N. NEWQUIST, New York: These opportunities exist primarily for rendering an unbiased constructive medical service to the employer and to the employee and they should not be converted into a means for soliciting patients. Fortunately there has been very little abuse of these opportunities. The opportunity to render medical service in industry should be considered in its preventive, administrative and curative phases. Include visits to the plant at regular intervals, participate in the control of sanitation and in the administration of benefit plans where health is involved. It is a job in "human engineering" from start to finish. I know of no better human engineer than the doctor. Progress in industrial medicine will continue to be slow until more employers provide the opportunity. Doctors cannot go into a plant uninvited. On the other hand, employers are not willing to embark on a health program without being reasonably assured that it will justify its cost. Actual demonstrations by physicians that good industrial medical service will pay dividends is the best way to educate employers. A "speed up" in the progress of industrial medicine is in the offing with the more widespread teaching by medical schools, the American Medical Association and other medical organizations of industrial medicine in all its phases including industrial toxicology, occupational disease and engineering methods for their control. The practice permitting first aid men and other nonqualified persons to make physical examinations of employees should be discontinued. The general practitioner will continue to play an important role in serving the numerous small industrial establishments widely scattered throughout the country. He can cope with most of the medical situations which arise in the average plant. In the relatively few obscure problems it is the part of wisdom anyhow to call in a qualified consultant. If employers would abandon the "cash and carry" method for obtaining medical service and would charge their plant physicians with appropriate responsibility for engineering the health of their human machinery, the whole complexion of the field of industrial medicine would assume a more healthful hue.

ACUTE APPENDICITIS IN CHILDREN

A CLINICAL STUDY OF MORE THAN 1,000 CASES

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There is probably no one subject in the entire field of surgery that has aroused more widespread interest among the public and the members of the medical profession than that of acute appendicitis and its complications. Yet the very fact that at this session the American Medical Association is devoting a symposium to this topic, even though more than half a century has elapsed since the pioneer work of Reginald Fitz, seems proof enough that there remains a good deal of uncertainty, at times, as to methods of management of the patient with appendicitis. Much progress, nevertheless, has been made and is being made, especially as the result of careful clinical studies in large series of cases. Too often, however, papers have been written on evidence obtained by a review of hospital records rather than from personal observation of patients, and therefore the conclusions drawn have sometimes not been as reliable as they should be. Too often, also, statistics have been published as to the effectiveness of treatment without clear differentiation between perforations of the appendix which clinically have remained localized (with a definitely palpable mass) and those which have obviously involved the open peritoneal cavity.

We submit here the result of what we consider a careful personal clinical study of well over 1,000 cases of acute appendicitis and its most frequent complications observed by us at the Children's Surgical Ward of the Cook County Hospital, Chicago, during a little more than four years, hoping that from it certain conclusions

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may be drawn which will be helpful in clarifying the still existing uncertainty as to reliable indications for and against operative intervention.

CLASSIFICATION AND TREATMENT

During the past twenty-odd years of surgical practice it has gradually become apparent to us that, from a clinical point of view, patients with acute appendicitis and its most common complications, whether children or adults, fall naturally into one of three fairly clearcut, fairly well defined groups, and we feel that it is highly important for one to decide, or at least to attempt to decide, into which of these each patient belongs, as this decision may materially influence the course of treatment.

GROUP 1.—This group comprises all patients who are obviously suffering from an attack of acute appendicitis before the stage of perforation. It seems hardly necessary here to elaborate in detail either on the usual "textbook" picture or on the difficulties that may arise in making a diagnosis when the atypical case is encountered. Suffice it to say (for the purpose of this discussion) that we believe it to be the consensus today that appendectomy as soon as the diagnosis is made is the treatment of choice, except for those patients in whom the attack is definitely subsiding. In our study there were 629 patients in this group, all of whom were successfully operated on without a single death. Would that every patient when first seen by the surgeon could be included in this group.

GROUP 2.—In this group a longer duration of symptoms is noted. The characteristic clinical observations are obviously those associated with a perforation of the appendix against which there has been set up from the time of perforation an adequate local defensive mechanism. A careful history will usually show that the patient has been sick for several days, perhaps a week or ten days or even longer. He does not as a rule appear desperately ill. The fever may be fairly high and the leukocyte reaction well marked, but he does not have an anxious expression, nor is he suffering intense pain. On abdominal examination with the patient relaxed and the thighs held in flexion, one can make out by palpation the margins of a definite mass, varying in size from that of a walnut to that of an orange or perhaps even a small grapefruit and varying considerably also in position. Though it usually occupies the right lower quadrant, it may be felt well into the right flank; sometimes it is in the left lower quadrant, and not infrequently it is deep in the pelvis, where it can be made out only with the finger in the rectum. Occasionally it is so deeply situated in the main abdominal cavity and so covered by large tense abdominal muscles that its presence is made certain only after complete relaxation induced by an anesthetic, and in extremely rare instances it may not be discovered until after the incision has actually been made and the walled-off process seen with the naked eye or felt with the examining finger. The point we wish to make is this: Whatever its size, whatever its position and however its presence may be detected, it represents pathologically a slow leak from the appendix, which has become effectively sealed off from contact with the open peritoneal cavity.

As to the treatment of the patient in this group, we are well aware that there is still a considerable difference of opinion even among competent surgeons. Many feel that the majority, if not all, of these so-called appendical abscesses should be drained early, and some even go so far as to advocate a serious attempt at removal of the appendix at the same time. With this attitude we cannot agree; such a policy is neither safe nor necessary. It is not safe, because, if between the wall of that palpable mass and the parietal peritoneum there are normal loops of bowel, spreading peritonitis is apt to be produced by the attempt at drainage; it is not necessary, because in the vast majority of cases the mass will spontaneously disappear. Our study furnishes ample evidence to prove that with more than 90 per cent of these patients careful observation over a period of days will reveal a gradual improvement in the clinical picture, a gradual reduction in the temperature and the leukocyte count, a progressive diminution in the size of the inflammatory mass and, finally, after perhaps ten days to four or five weeks, its complete disappearance, as far as one can tell by physical examination. We advise these patients to return to the hospital after approximately three months, when they are feeling perfectly well. The appendix may then safely be removed, no matter how densely it may have been involved in adhesions. Only a few cases in this group (in our experience) will take the opposite course, with a progressive aggravation of the clinical picture and a progressive enlargement of the palpable mass to the stage at which it represents unquestionably a real "abscess." Under these circumstances it will have definitely tried to point somewhere, either anteriorly against the parietal peritoneum, where it can easily and safely be drained through what amounts to an extraperitoneal approach, or downward more deeply into the true pelvis, where it can be felt as a soft bulging mass against the anterior wall of the rectum and where it has a fair opportunity to break through spontaneously without the aid of surgical intervention. In our study, 228 patients have been classed in this group. Of these, twenty-five were operated on for drainage, but I am sure that for some of these the procedure was not necessary, and a longer period of observation would doubtless have shown this to be true. All of the others (203) were given the benefit of watchful conservatism, and of these 198 recovered, a mortality of only 2.5 per cent.

GROUP 3.—In contradistinction to those in groups 1 and 2 the cases included in group 3 represent acute perforations of the appendix into the open peritoneal cavity, perforations against which there has at no time been established an adequate defense. Pathologically speaking, in many of them the condition is of the obstructive type, with a large fecal stone, and the perforation is grossly of considerable size. To use a crude simile, it is not unlike a sudden "blowout" of a tire, in contrast to a slow leak. Often the streptococcus is the predominant organism, and often too the patient's resistance to infection is low. As a rule he looks very sick; there is a pinched, anxious expression; the tongue is dry; the pulse is fast, and the fever and leukocyte count are variable. The knees are held in flexion; the breathing is thoracic; the abdomen is distended; on palpation one finds the muscles everywhere tense, and there is more or less general tenderness, at times even in the left flank. The whole picture is suggestive of spreading peritonitis.

What shall we say as to the care of this patient? Has he a better chance to recover if he is not operated on and use is made of the so-called Ochsner method of treatment, with Fowler's position, adequate physiologic solution of sodium chloride and dextrose given by vein and under the skin, restriction of fluid by mouth, a Levine tube for relief of distention, and administration of mild sedatives, in the hope of diminishing

peristalsis and perhaps of localizing the spreading infection? Without question, a number of surgeons hold this view (many of prominence among them), and it would take a bold critic to claim that such measures are not of great value. But we would ask these surgeons: Would they apply this conservative regimen to all patients in this group or to only a few? And if to only a few, to which ones? Would they apply it only in the late stages or in the early ones as well? Would they apply it only to patients with evidence of widespread involvement of the peritoneum or to those also in whom the infection is apparently limited? We have often heard it said that if the patient has been sick for less than forty-eight hours he should be operated on; if for more than forty-eight hours, operation will be withheld. Some place the limit of time at even less; others would arbitrarily fix it at fifty-six hours or even more. To these points of view we humbly and in all seriousness express our belief that no physician, however wise he may be, can hope to judge accurately the rapidity of pathologic changes; no physician, even from the most carefully obtained history (especially with children) can be certain as to the exact duration of the attacks of appendicitis (which is so often preceded or accompanied by other things which cloud the picture); no finally, use of a measure which has lately been emphasized by Gatch and his associates and has been used by us empirically for a long time, i. e. replacement of lost plasma protein (both before and after operation) by means of blood transfusion.

As to the technic of the operative procedure for patients in this group, perhaps little need be said. The McBurney incision is almost always employed. Cultures are always made of the free pus when the peritoneum is opened. The Poole suction tip has practically replaced the use of sponges in the abdominal cavity. The perforated appendix is delivered with a Babcock forceps, which encircles its wall; the stump is always ligated with catgut and whenever possible is buried beneath a catgut purse string. As to the matter of drainage, there is still considerable difference of opinion among our own group as to its value. Some are bold enough to close these incisions without a drain. (We have had occasion several times to open these incisions later to allow free evacuation of foul-smelling pus, and in one instance, in which a diffuse anaerobic phlegmon of the entire right abdominal wall had developed subsequent to a tight closure, we were obliged to reflect enormous flaps of skin to expose the area involved to the open air.) A few prefer to close the peritoneum

Summary of Cases of Acute Appendicitis (Children's Surgical Ward, Cook County Hospital)

	Group 1 Without Perforation							Group 2 With Perforation and Localized Palpable Mass							Group 3 With Perforation and Spreading Peritonitis						
	1934	1935	1936	1938	1939	1940	Total	1934	1935	1936	1938	1939	1940	Total	1934	1935	1936	1938	1939	1940	Total
Number of cases (1,163)..	111	86	99	153	126	54	629	59	32	40	37	46	14	228	67	57	39	45	61	37	306
Operative treatment.....	111	86	99	153	125	54	629	5	6	4	8	1	1	25	54	55	33	41	61	37	281
Recoveries.....	111	86	99	153	126	54	629	4	6	4	7	1	1	23	46	46	29	33	57	34	242
Deaths.....	0	0	0	0	0	0	0	1	0	0	1	0	0	2	8	9	4	8	4	3	36
Mortality, %.....	0	0	0	0	0	0	0	20	0	0	12.5	0	0	8	14	16	12	19.5	6.5	8.1	12.8
Conservative treatment	0	0	0	0	0	0	0	54	26	36	29	45	13	203	13	2	6	4	0	0	25
Recoveries.....	0	0	0	0	0	0	0	50	26	36	29	44	13	198	5	0	0	0	0	0	5
Deaths.....	0	0	0	0	0	0	0	4	0	0	0	1	0	5	8	2	6	4	0	0	20
Mortality, %.....	0	0	0	0	0	0	0	7	0	0	0	2.2	0	2.5	61	100	100	100	0	0	80

physician can always be sure of the exact time when the perforation has occurred, nor can he be certain, even by the most painstaking examination, of the extent of involvement of the peritoneum by the spreading infection. If these statements are true, why should one allow such unreliable criteria as these to influence one as to the decision for or against surgical intervention?

The answer is that one should not. We are of the firm opinion that those who advocate a conservative course with patients in this group are wrong, because it appears to us that the essence of the treatment should consist in removal of the ruptured appendix, which closes the leak through which a constant stream of infected material is being fed into the peritoneal cavity. Just as with an open perforation of a duodenal or a gastric ulcer, the essential thing is to close the opening as soon after it occurs as possible. With us there has been, therefore, an ever increasing tendency over a period of years to apply this policy of immediate operation to practically all patients in this group, no matter how much time seems to have elapsed since the onset of illness, and we are more and more convinced of the wisdom of this course. We do not, however, wish to give the impression that when we use the term "immediate operation" we mean that the patient is sent from the admitting room to the operating table, for long since we have seen the value of adequate preparation, with restoration of the electrolyte and fluid balance, relief of distention as far as possible with a Levine tube and, and drain only the incision itself. We believe, as do most other surgeons, that it is not mechanically possible completely to drain the infected peritoneal cavity by the introduction of one or more tubes, yet we continue to use drainage in every case of perforation, always employing drains of the soft cigaret type and always placing them as near the source of the infection as possible. Especially do we feel that they are of value when the perforation has occurred behind the cecum, because they may help to prevent an ascending infection in tissues not protected by peritoneum and thus minimize the likelihood of a subphrenic abscess.

With what success has this regimen been rewarded? A glance again at the accompanying table will show that in this period of a little over four years 306 patients have been classed in group 3. Of these, only twenty-five (8 per cent) were treated conservatively, with a mortality of 80 per cent, whereas 281 (90 per cent) were given the benefit of "immediate" operation, with 242 recoveries (mortality, 12.8 per cent). It will also be noted that in the past two years all patients were operated on, no matter how much time had followed perforation.

CONCLUSIONS

1. Immediate appendectomy is indicated in all cases of acute appendicitis before perforation unless the attack is clearly subsiding.

2. When the clinical evidence shows that the appendix is ruptured and the infection is definitely localized

(demonstrable by a palpable mass), a conservative course is indicated. Only a few patients will need surgical drainage.

3. In all cases in which spreading peritonitis is present without evidence of localization, it is a wise plan to remove the source of the infection as early as possible, institute proper surgical drainage and make every effort postoperatively to restore to the circulating blood whatever elements have been reduced as the result of the infection.

THE MORTALITY FROM ACUTE APPENDICITIS IN THE JOHNS HOPKINS HOSPITAL

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It is well known that death seldom follows the competent removal of an acutely inflamed but unperforated appendix.[1] At present, however, surgeons disagree as to the proper treatment of patients having acute appendicitis with one or more complications. Our own uncertainty led us to study the results of the treatment of acute appendicitis as carried out in the Johns Hopkins Hospital.

In the surgical service of the Johns Hopkins Hospital patients considered to have acute appendicitis in any stage of the disease are subjected to immediate operation. From Sept. 1, 1931, to Sept. 1, 1939, 1,317 of these patients had acute appendicitis. All cases in which there was no gross perforation of the appendix are classified under simple acute appendicitis. All those in which perforation of the appendix was found at operation (except those in which rupture was caused by handling during operation) are divided into two groups:

1. Appendicitis with perforation and abscess formation.

2. Appendicitis with perforation and peritonitis.

No attempt has been made to distinguish between "local," "spreading" and "generalized" peritonitis. We agree with Ladd,[2] who stated that "no surgeon really knows how diffuse the process is unless he has done a very improper operation." Table 1 summarizes the results.

TABLE 1.—*General Summary of Results*

Condition	No. of Patients	Deaths	Per Cent
Simple acute appendicitis	838	0	0
Appendicitis with perforation and abscess	283	20	7.06
Appendicitis with perforation and peritonitis	196	28	14.23

It will be seen from this table that more than one third of the patients suffering from acute appendicitis were found to have perforation of the appendix by the time they sought treatment in this hospital and that it was this group in which the deaths occurred. Although 90 per cent of these patients recovered, many seemed clinically just as ill on admission as some who died. In an effort to find out whether it was the treatment employed at this hospital or some other factor which was responsible for the different outcome, we have made a study of the forty-eight fatal cases.

TABLE 2.—*Chief Causes of Death*

Cause of Death	No. of Cases	Autopsy
Direct complications of appendicitis		
Generalized peritonitis	13	11
Pylephlebitis	4	2
Septicemia	1	0
Inadequate treatment	14	9
Extra-appendical complications		
Cerebral accident	1	0
Pulmonary embolism	3	2
Pneumonia	4	2
"Poor risk" patients	4	3
Cause of death uncertain	4	2
Total	48	31

In table 2 we have listed the chief causes of death. These fall into several well defined groups (tables 3 to 9 inclusive). Postmortem examination was made in thirty-one of the forty-eight cases.

TABLE 3.—*Group 1 (Death from Acute Generalized Peritonitis Less than Seventy-Two Hours After Operation)*

Case	Race, Sex, Age	Duration of Symptoms	Operative Diagnosis	Postoperative Course, Hours	Autopsy
1	W ♂ 2	36 hr.	Peritonitis	20	Generalized peritonitis
2	W ♀ 2	5 days	Peritonitis	30	Generalized peritonitis
3	W ♂ 2	4 days	Peritonitis	36	Generalized peritonitis
4	C ♀ 6	3 days	Peritonitis	12	Generalized peritonitis
5	C ♂ 7	3 days	Peritonitis	12	Generalized peritonitis
6	C ♂ 8	4 days	Peritonitis	70	No autopsy
7	C ♂ 9	3 days	Abscess	44	Generalized peritonitis
8	C ♂ 21	3 days	Peritonitis	40	Generalized peritonitis
9	C ♂ 41	7 days	Peritonitis	16	Generalized peritonitis
10	C ♀ 47	10 days	Peritonitis	6	Generalized peritonitis
11	C ♀ 48	7 days	Peritonitis	12	No autopsy
12	C ♂ 50	5 days	Peritonitis	60	Generalized peritonitis
13	C ♂ 59	14 days	Peritonitis	12	Generalized peritonitis

Material for culture was taken in a routine manner both at operation and at autopsy. Colon bacilli and streptococci were commonly found, but Clostridium welchii was found only twice. It is interesting to note that ten of these thirteen patients were Negroes.

It is not known why some patients die of peritonitis, whereas others, with apparently the same kind of infection and degree of illness, recover. In only one of these cases was there any localization of the peritonitis. The resultant spread of the peritonitis in this case may possibly be ascribed to the operative procedure.

TABLE 4.—*Group 2 (Death from Pylephlebitis with Multiple Abscesses of the Liver and Septicemia)*

Case	Race, Sex, Age	Duration of Symptoms, Days	Operative Diagnosis	Postoperative Course	Autopsy
1	C ♂ 11	5	Abscess	36 days	Pylephlebitis; multiple liver abscesses; septicemia
2	C ♂ 34	4	Peritonitis	29 days	No autopsy
3	W ♀ 56	6	Abscess	67 days	Pylephlebitis; multiple liver abscesses; septicemia
4	W ♀ 58	5	Peritonitis	48 hr.	No autopsy

From the Department of Surgery, the Johns Hopkins University School of Medicine.

Read before the Section on Surgery, General and Abdominal, at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

1. Johnson, L. W., and Boone, H. R.: The Navy and Appendicitis, U. S. Nav. M. Bull. **35**: 41 (Jan.) 1937. Bliss, R. W., and Heaton, L. D.: Appendicitis in Army Service: Report of 2,100 Cases, Ann. Surg. **107**: 242 (Feb.) 1938.

2. Ladd, W. E.: Immediate or Deferred Surgery for General Peritonitis Associated with Appendicitis in Children, New England J. Med. **219**: 329 (Sept. 8) 1938.

As the first of these patients had severe chills prior to operation, he probably had pylephlebitis before the appendix was removed. The diagnosis of pylephlebitis in the second case was substantiated by laparotomy, which disclosed multiple abscesses of the liver. This patient was deeply jaundiced, and colon bacilli were repeatedly cultured from his blood. The fourth patient was deeply jaundiced on admission.

In group 3, one patient died with peritonitis, septicemia and leukopenia. This patient, a 37 year old Negress, had generalized peritonitis found at operation five days after onset of symptoms. A heavy growth of Bacillus coli was obtained from samples of blood taken preoperatively and postoperatively. The marked and persistent leukopenia (leukocyte count, 3,400 to 7,600 per cubic millimeter), with a normal differential count, probably indicated a poor response on the part of the patient to an overwhelming infection. Death occurred five days after operation. Repeated transfusions failed to influence the leukopenia. There was no autopsy.

TABLE 5.—*Group 4 (Death from Complications Inadequately Treated)*

Case	Race, Sex, Age	Duration of Symptoms	Operative Diagnosis	Postoperative Course, Days	Autopsy
1	C ♂ 8	36 hr.	Peritonitis	5	Mechanical ileus involving lower part of ileum
2	C ♂ 33	4 days	Abscess	5	Mechanical ileus involving lower part of ileum
3	W ♂ 23	4 days	Peritonitis	8	Mechanical ileus involving lower part of ileum
4	W ♀ 10	2 days	Peritonitis	23	Mechanical ileus involving terminal part of ileum; generalized peritonitis
5	W ♂ 9	3 days	Peritonitis	23	No autopsy
6	C ♂ 11	6 days	Abscess	7	No autopsy
7	C ♂ 33	2 days	Peritonitis	10	No autopsy
8	C ♂ 20	48 hr.	Peritonitis	20	Left subphrenic abscess with extension through diaphragm; multiple lung abscesses
9	C ♂ 55	36 hr.	Peritonitis	37	Right subphrenic abscess with extension through diaphragm and into liver; multiple lung abscess
10	C ♂ 43	8 days	Abscess	45	Left subphrenic abscess with extension through diaphragm; multiple lung abscesses
11	W ♂ 16	5 days	Abscess	26	No autopsy
12	C ♀ 10	5 days	Abscess	25	No autopsy
13	W ♂ 43	2 days	Abscess	72	Rectovesical fistula; cystitis; pyelonephritis
14	C ♂ 20	10 days	Abscess	9	Generalized peritonitis

The most frequent complication in group 4 was mechanical ileus, which caused seven deaths. It is often difficult to distinguish between mechanical and paralytic ileus. The latter commonly accompanies peritonitis and responds well to conservative treatment, whereas delay in the relief of mechanical ileus is fatal. When the surgeon can make the diagnosis of mechanical ileus he is still faced with the difficult problem of dealing with the obstruction. Whether to perform simple enterostomy or to release the obstructed bowel in any given case requires nice judgment. The seven cases of mechanical ileus in this group represent failures. In cases 1 and 2 the mechanical nature of the obstruction was recognized late, and an enterostomy was performed only a few hours before death. The fact that patient 3 had a mechanical obstruction was unrecognized until postmortem examination was made. In cases 4 and 5 the fatalities resulted from the complications of surgical procedures designed to relieve the obstruction directly. In case 4 a laparotomy was performed sixteen days after the appendectomy. The lower part of the ileum was badly traumatized in freeing dense adhesions, necessitating a resection. This procedure failed to relieve the obstruction and also caused a secondary flare-up of peritonitis. In case 5 a laparotomy with release of adhesions was performed eight days after appendectomy and again two days later. The patient stood these procedures satisfactorily. Disruption of the wound occurred, in the course of which a high loop of jejunum was traumatized by contact with a through and through stay suture, producing a high intestinal fistula. There was no postmortem examination in the sixth and seventh cases, but a review of the clinical record leaves no doubt that the cause of death was an unrecognized mechanical ileus in both instances.

The course of events in the next five cases in this group was almost identical. The patients all did well at first, but later subphrenic abscesses developed, which were not recognized clinically. In each instance the abscess perforated through the diaphragm into the lung, causing fatal pulmonary abscesses. In case 11 there was no postmortem examination but there is little doubt as to what occurred. The patient had had abnormal physical signs at the base of the right lung for several days. Suddenly he began coughing up great quantities of foul pus in which the colon bacillus was the predominant organism. He became cyanotic and rapidly weaker and died in a few hours. Study of the clinical record suggests that patient 12 also had an unrecognized right subphrenic abscess.

In the thirteenth case the bladder was entered in an attempt to drain a pelvic abscess through the rectum. A persistent rectovesical fistula formed and resulted in a fatal ascending infection of the urinary tract. The last patient in this group entered the hospital with urinary symptoms. He was found to have a pelvic abscess lying against the bladder. This was drained through the abdominal wall, no attempt being made to remove the appendix. The patient progressed well for seven days, when generalized peritonitis suddenly developed and he died in forty-eight hours. Postmortem examination showed the pelvic abscess nearly healed, but there was also a smaller abscess about the perforated appendix in the right lower abdominal quadrant. This untreated abscess had ruptured into the general peritoneal cavity.

In group 5, one patient died as a result of a cerebral accident. This patient, a white woman aged 67, had an appendical abscess at operation ten days after the onset of symptoms. She seemed to be progressing favorably for twenty-four hours after operation, when she suddenly lost consciousness; bradycardia and bradypnea developed, and she died within an hour. There was no autopsy.

TABLE 6.—*Group 6 (Death from Massive Pulmonary Embolism)*

Case	Race, Sex, Age	Duration of Symptoms, Days	Operative Diagnosis	Postoperative Course, Days	Autopsy
1	W ♂ 75	14	Abscess	14	Thrombi in right pulmonary artery
2	C ♂ 49	3	Abscess	10	Emboli in pulmonary arteries
3	W ♀ 35	8	Abscess	14	No autopsy

All of these patients were convalescing uneventfully until the sudden onset of the fatal complication.

TABLE 7.—*Group 7 (Death from Pneumonia)*

Case	Race, Sex, Age	Duration of Symptoms, Days	Operative Diagnosis	Postoperative Course, Days	Autopsy
1	W ♂ 13	5	Peritonitis	4	Bilateral bronchopneumonia, pneumococcus type 2
2	C ♀ 52	3	Peritonitis	6	Pneumonia and atelectasis
3	C ♂ 45	4	Peritonitis	3	No autopsy
4	W ♂ 55	5	Abscess	4	No autopsy

All of these patients appeared to improve for twenty-four to forty-eight hours after operation and then suddenly became critically ill, with clinical signs and x-ray evidence of pneumonia. It is interesting to note that two of the patients were operated on under spinal anesthesia; ether by open drop was used for the third and local infiltration anesthesia for the fourth. These deaths occurred before the introduction of sulfapyridine.

TABLE 8.—*Group 8 (Death Due to Poor General Condition Prior to Onset of Appendicitis)*

Case	Race, Sex, Age	Duration of Symptoms	Operative Diagnosis	Postoperative Course	Autopsy
1	W ♂ 57	24 hr.	Abscess	4 hr.	Addison's disease; tuberculosis of both adrenals
2	W ♂ 75	2 days	Abscess	12 days	Diabetes mellitus
3	C ♂ 55	6 days	Abscess	5 days	Diabetes mellitus
4	W ♀ 70	7 days	Abscess	5 days	No autopsy

The first patient was being unsuccessfully treated for Addison's disease when his symptoms of appendicitis began. His blood pressure, already low, fell further before operation and continued to drop after operation despite vigorous treatment. Patients 2 and 3 had severe diabetes mellitus which was difficult to control. Postmortem examination in each instance failed to show any definite cause of death, leading us to conclude that the general debility of these patients, together with their diabetes, rendered them unable to withstand the local infection and paralytic ileus incident to their condition. The fourth patient was a frail old woman who had had a laparotomy with hysterectomy many years previously. Old dense adhesions were found when the abdomen was opened, and the ileum was torn in the process of removing the appendix and draining the abscess. The operative procedure was long, but at first the patient seemed to do well. A fecal fistula developed three days after operation, and signs of pneumonia were observed on the following day. There was no evidence of ileus or peritonitis. No postmortem examination was made. It can be reasonably argued that this patient died as a result of too much surgical treatment. On the other hand, had the patient been younger and stronger or had there not been the technical difficulty resulting from the earlier operation, death might not have occurred.

TABLE 9.—*Group 9 (Death from Obscure Causes)*

Case	Race, Sex, Age	Duration of Symptoms	Operative Diagnosis	Postoperative Course, Days	Autopsy
1	W ♂ 48	24 hr.	Peritonitis	4	Healing pelvic peritonitis
2	W ♀ 49	4 days	Peritonitis	7	No autopsy
3	W ♀ 60	14 days	Abscess	6	No autopsy
4	C ♂ 26	5 days	Abscess	12	Healing peritonitis

The first patient was considered clinically to have had pneumonia following operation. This was not verified at postmortem examination, nor was anything found to explain his death. The second patient was very obese. There was a persistent high fever after operation but no clinical evidence of peritonitis or ileus. She too was thought to have pneumonia. Postmortem examination was not made. The third patient appeared to improve after operation, but four days later azotemia developed; the patient became comatose and died on the sixth postoperative day. The clinical record of this patient does not justify any conclusion as to the cause of death. The fourth patient was very ill on admission and was thought to have mechanical ileus. In addition to appendectomy, an ileostomy was performed. The patient improved considerably for one week and then began to bleed profusely from the ileostomy wound. The bleeding decreased on removal of the enterostomy tube, but the patient became jaundiced after a severe transfusion reaction. Again he seemed to improve for a few days; then he died suddenly, without showing any new symptoms or signs. Postmortem examination did not furnish any explanation for his death. The typical lesions of mismatched transfusion were not found.

COMMENT

A number of recent papers have dealt with such technical matters as the choice of an anesthetic agent, the type of incision to be used, the manner of dealing with the appendical stump and the advantage of high ligation of the appendical vein. The principles of treatment are more important than the details. The anesthetic agent must be suited to the individual patient. A small muscle-splitting incision is adequate in most instances and will cause little trauma and spread of the infection, but we do not hesitate to use other types of incision when the need exists. Whether the stump of the appendix should be ligated and/or inverted depends on the operator's judgment in any given case. In our series of appendectomies there was no resultant abscess at the site of inversion, nor did a fecal fistula fail to heal spontaneously in a patient who survived. Only four of our patients had pylephlebitis, and two of these had it before operation. More harm would result from attempts to secure high ligation of the appendical vein than from the ordinary procedure. The use of drains is open to question. We have employed drainage as a matter of routine when pus was present but have come to feel that the presence of drains may in some instances produce the adhesions which cause mechanical ileus. We are not prepared to say whether this danger is greater than that of the complications which might arise if drainage were not employed.

The most controversial subject which has arisen with regard to appendicitis is the so-called delayed or expectant treatment of perforative appendicitis. We feel unequivocally that this is poor treatment and that advocacy of this method has had an unfortunate effect on the general practitioner. In the first place, the most experienced surgeons are at times unable to determine with accuracy whether or not an acutely inflamed appendix has perforated. Granted that a patient has signs of peritonitis, it is not always possible to know the cause before operation. We are not alone in having discovered through a McBurney incision that peritonitis may be due to perforation of a peptic ulcer, to Meckel's diverticulum or to an infected diverticulum of the sigmoid flexure of the colon. In the past two years one of us has operated in three cases of primary pneumo-

coccic peritonitis, having made a preoperative diagnosis of perforative appendicitis. The correct diagnosis, made at operation, permitted treatment with specific serum and sulfapyridine, with prompt recovery. Rhodes [3] kept a careful record of preoperative diagnoses made by a number of examiners and found that they were from 34 to 53 per cent incorrect with reference to the local pathologic condition, position of the appendix and extent of peritonitis. Selection of cases for delayed treatment on the basis of such predictions seems hazardous, to say the least.

Advocates of delayed treatment postulate that delay in operation affords a better opportunity to the body mechanism for defense against the infection. Doubtless the principle of physiologic rest for the affected tissues is as important here as in other parts of the body, and certainly handling and operative trauma should be minimized. We believe, however, that the first step in treatment should be elimination of the source of infection. This principle is not questioned in dealing with other perforative lesions of the gastrointestinal tract. Putting the gastrointestinal tract at rest with sedatives and restricting the diet, with the use of continuous gastric or duodenal drainage and intravenous fluids, are essential adjuncts to the treatment of appendicitis. In support of this statement we submit the figures in a series of cases observed in this hospital prior to 1931, before continuous suction and intravenous fluids were commonly used. In a series of eighty-five consecutive cases of perforative appendicitis treated in this hospital during the years 1928 to 1931 there were sixteen deaths, a mortality rate of 18.8 per cent. This is nearly twice that of our present series. The only real differences in treatment in the two series were the institution of suction and the administration of intravenous fluids in the cases making up the present series.

It has been argued that operation on an appendical abscess often spreads infection. In our series 283 patients with appendical abscess were subjected to immediate operation. In only two of them did spreading peritonitis cause death, and in one of these two the outcome was due to our failure to recognize and deal with the primary appendical abscess. In the other case it is not certain whether the spread of infection occurred before, during or after operation.

Another disadvantage of conservative treatment of perforative appendicitis is the fact that the appendix has not been removed when the patient recovers. It is often difficult to persuade a well person to have an appendectomy. This fact is shown by the reports on this method of treatment; a return to the hospital for appendectomy is secured at best in only 50 per cent of the patients. It is well known that further attacks of appendicitis will follow the first, and, in our experience, of forty-three patients in whom the appendix was not removed at the first operation, eight returned with a second attack of perforative appendicitis.

Finally, a comparison should be made of the mortality rates following the two methods of treatment. We are unable to do this satisfactorily, since no adequate basis for comparison can be established. The various advocates of the conservative method of treatment differ among themselves as to the selection of cases for that type of treatment. The mortality rates reported by some [4] vary from 8.1 per cent to almost 20 per cent for the series of cases selected for conservative treatment. The general average for the group is about 14 per cent. Patients entering the hospital in a moribund condition are often not included in the statistics of these reports, whereas all patients have been included in our series. The general mortality rate in our series is lower than the average rate for delayed treatment and is nearly as low as that of the most carefully selected series of cases. When we remember that many of the deaths in our series might have been prevented by better diagnosis and treatment, we feel justified in attempting to improve our mortality rate by more careful study and by better treatment of complications, rather than by adopting the method of delayed treatment.

3. Rhodes, G. K.; Birnbaum, Walter, and Brown, M. J.: Acute Appendicitis: Clinical Review of One Thousand Consecutive Cases, California & West. Med. **45**: 458 (Dec.) 1936.

SUMMARY

In a series of 1,317 consecutive cases of acute appendicitis, in all of which the condition was treated by immediate operation, perforation of the appendix with either abscess or peritonitis was found in 479. There were no deaths in the 838 cases in which perforation had not occurred. There were forty-eight deaths in the group of 479 cases, a mortality rate of 10 per cent. A study of the fatal cases leads us to conclude that some of these deaths should have been prevented by more careful diagnosis and better treatment of the postoperative complications. Even so, the mortality rate in our series is lower than the average reported for the delayed or expectant treatment of perforative appendicitis. For this reason and for the other reasons given we feel justified in continuing to perform immediate operation in the treatment of appendicitis.

4. Gardner, C. E., Jr.: The Conservative Management of Appendical Peritonitis, South. M. J. **32**: 157 (Feb.) 1939. Kirtley, J. A., Jr., and Daniel, R. A., Jr.: Acute Appendicitis: Study of 1,000 Consecutive Patients, Surgery **2**: 215 (Aug.) 1937. Sperling, Louis, and Myrick, J. C.: Acute Appendicitis; Review of 518 Cases in University of Minnesota Hospital from 1932 to 1935, ibid. **1**: 255 (Feb.) 1937. Coller, F. A., and Potter, E. B.: Treatment of Peritonitis Associated with Appendicitis, J. A. M. A. **103**: 1753 (Dec. 8) 1934. Walker, I. J.: Immediate or Deferred Surgery for General Peritonitis Associated with Appendicitis in Adults, New England J. Med. **219**: 323 (Sept. 8) 1938.

Wolf-Children.—In his presidential address on this subject delivered before the Folk-Lore Society on February 21 . . . Dr. J. H. Hutton deals with the cases recorded from classical antiquity down to the present time of children having been reared by animals, especially wolves. The earliest record of a wolf-child which he has discovered in northern Europe is that reported by William Dilich in 1341 as occurring in Hesse. Two Lithuanian cases of wolf-children were described by Connor in his "History of Poland," published in 1698, since when no cases have been described in Europe. Many recent cases, however, have been reported from India, mostly from the United Provinces, and also from Central India, as well as from Africa. Wolves are not the only animals which have been said to have carried off and suckled children. In classical antiquity, Atalanta is stated to have been suckled by a bear and Cyrus by a bitch, while in recent times bear-children, jaguar- and leopard-children have been recorded in India, and lion-children and a baboon-child in Africa. It is a remarkable fact that no stories of the kind have been reported from the New World, where examples of wolf- and bear-children might have been expected from North America and jaguar- and puma-children from South America. Although it has been suggested that wolf-children are idiots who have wandered into the jungle and taken up their abode in the dens of wolves, this hypothesis is by no means universally applicable, notably in the case of the jaguar-child in the North Cachar Hills, India. Dr. Hutton comes to the conclusion that the evidence from India of wolf- and leopard-children and from Africa of a baboon-child seems to support the hypothesis that the belief is founded on observed facts.—*Nature* **146**:58 (July 13) 1940.

TREATMENT OF APPENDICAL PERITONITIS

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A critical review of 1,039 consecutive patients with acute appendicitis admitted to the Charity Hospital of Louisiana at New Orleans was undertaken in an endeavor to determine the most satisfactory method of treatment. In the entire group,[1] a large proportion of which came under our immediate care, there were fifty-six deaths, or a mortality rate of 5.3 per cent, a figure similar in magnitude to that obtained by others. A uniform request was sent to the record rooms of municipal hospitals in different parts of the United States. The results for a comparable period are shown in table 1.

In 860 (83 per cent) of the 1,039 cases the appendix was not ruptured at the time of entry. Prompt appendectomy was performed in every instance and was associated with seven deaths, or a mortality rate of 0.8 per cent. In one of the seven fatal cases the appendix was ruptured, with soiling of the peritoneal cavity during its removal. (In three other cases of acute appendicitis without perforation similar accidents occurred, without untoward sequelae.) Of the patients with appendicitis without perforation in this group, one in 123 died. Therapy of acute appendicitis without perforation will not be considered further.

One hundred and seventy-nine patients (17 per cent) had appendical peritonitis at the time of entry. Of this number forty-nine, or 27.3 per cent, died. One of every 3.6 patients with appendical peritonitis in this series died (chart 1).

Detailed analysis of these figures by age groups shows that the incidence of perforation with acute appendicitis is highest in childhood and in old age, although the incidence of the disease itself is highest in adolescence and early adult life, with 70 per cent of the patients between 10 and 30 years of age.

A reverse relationship obtains between the incidence and the case fatality rate; i. e., where the incidence is high, the mortality is low. In other words, the relationship between the percentage of patients with appendical peritonitis and the mortality in the various age groups is close, and the high mortality in the extremes of life is, in this series of patients, at least, more closely related to the high incidence of appendical peritonitis in that age group than to any other factor. The mortality rate of acute appendicitis without perforation in the various age groups is nearly the same, as is indeed that for patients with appendical peritonitis except in the group over 60 years of age, in which the mortality rate (table 2) rises sharply (eighteen patients and nine deaths).

Of the patients with acute appendicitis who died, 88 per cent had appendical peritonitis at the time of entry to the hospital. Of the total group, 17 per cent had appendical peritonitis at the time of entry.

In short, the problem of acute appendicitis in reality is the problem of prevention and treatment of appendical peritonitis. By far the safest and surest measure to prevent appendical peritonitis is prompt removal of the acutely inflamed appendix before perforation has occurred. In our opinion there is no conservative treatment of acute appendicitis without perforation.

In this series, as elsewhere, the most important factor in the production of appendical peritonitis and death in the patient with acute appendicitis has been delay in instituting treatment. Seventy-four per cent of the patients with appendical peritonitis and 54 per cent of the patients who died waited more than two days after the onset of their symptoms before coming to the hospital. Although exact information is not available in this group of patients to determine the effect of catharsis on the incidence af appendical perforation and the mortality, our experience has been similar to that of Haggard,[2] Bower [3] and others.

Of the 179 patients with appendical peritonitis, four died within so short a time that after admission to the hospital (less than twelve hours) that they will not be considered in the analysis except in computation of the mortality rate. All four were in shock at the time of entry. Three were not operated on. The fourth patient was unconscious and it was thought that she might have had a ruptured ectopic pregnancy. This patient died shortly after laparotomy, which showed generalized peritonitis of appendical origin. Three female patients who had generalized abdominal pain and tenderness associated with extremely rapid sedimentation rates were treated for pelvic inflammatory disease in the gynecologic service by hot douches, nourishing diet and enemas for distention. Although autopsy showed each of them to have appendical peritonitis, their cases teach little about treatment and will not be considered further except in computing the mortality rate. A girl aged 4 years was treated in the medical ward for gastro-enteritis for four days. Autopsy showed generalized peritonitis of appendical origin. A woman of 67 was treated in the medical ward with the diagnosis of cholecystitis. Autopsy revealed appendical peritonitis. A third patient, in the urologic service, was examined for a perinephric abscess. The patient died a few days after the removal of the perforated appendix through the exploratory lumbar incision.

TABLE 1.—*Patients with Acute Appendicitis*

Location of Municipal Hospital	Period	Number	Deaths	Mortality, per Cent
West coast	1938	1,419	61	4.4
South central	1938	145	10	6.8
Middle west	1938	211	13	6.1
South (Charity Hospital)	1937-1938	1,039	56	5.3

TABLE 2.—*Mortality Statistics*

Age	Mortality per Cent for Entire Group	Per Cent With Perforation	Mortality per Cent With Perforation	Mortality per Cent Without Perforation
0- 4	18	73	25	0
5- 9	7	25.3	27	0
10-19	3.6	14.6	25	0
20-29	3.2	12	15.6	1.5
30-39	7.6	16	36.8	2
40-49	5.5	24	23	0
50-59	6	27	22	0
60 plus	50	77.2	60	0

From the surgical Services of the Charity Hospital of Louisiana at New Orleans and the Lexington Clinic.
Read before the Section on Surgery, General and Abdominal, at the Ninety-First Annual Session of the American Medical Association, June 12, 1940.

1. Ochsner, Alton: Postoperative Treatment, South. M. J. **29**: 53 (Jan.) 1936.

2. Haggard, W. D.: Appendicitis: Analysis of 3,344 Cases, with Remarks on Delayed Operation in Delayed Appendicitis, Am. J. Surg. **28**: 71 (April) 1935.

3. Bower, J. O.: Report of State Society Committee on Appendicitis Mortality, Pennsylvania M. J. **38**: 257 (Jan.) 1935.

Indeed, incorrect diagnosis in cases of appendical peritonitis has been associated with the gravest prognosis. This was particularly true when enemas or catharsis had been used to relieve distention. A satisfactory prognosis cannot be expected without correct diagnosis and correct treatment. Except for determining the gross mortality rate in a statistical analysis, inclusion of such patients to determine proper methods of treatment would, in our opinion, confuse rather than clarify the results.

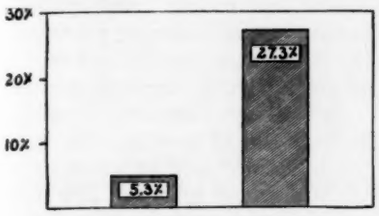

Chart 1.—Mortality of acute appendicitis. The column at the left represents the mortality percentage for the entire group, the column at the right for the group with appendical peritonitis.

Of the 169 patients with appendical peritonitis remaining, appendectomy was performed on ninety-four (55.9 per cent) as a primary procedure. Of these, thirty died, a mortality rate of 32 per cent. Seventy-five were treated by conservative methods (which included exploratory laparotomy without appendectomy and incision of residual abscesses as indicated), with nine deaths, or an indicated mortality rate of 12.6 per cent. Of fifteen patients with appendical peritonitis entering the hospital within twenty-four hours after the onset of their symptoms, twelve were treated by prompt appendectomy with two deaths; three were treated by conservative measures with two deaths (chart 2). Of ninety-two patients with appendical peritonitis entering the hospital from twenty-four to seventy-two hours after the onset of their symptoms, sixty-one were treated by immediate operation with fifteen deaths. Thirty-one were treated conservatively with five deaths (chart 3). Of sixty-two patients with appendical peritonitis whose symptoms were of more than three days' duration at the time of entry to the hospital, forty-one were subjected to immediate appendectomy, with three deaths; twenty-one were treated by prompt appendectomy with ten deaths (chart 4). We believe, however, that such figures fail to express accurately the entire situation, for we are convinced that operative intervention is the treatment of choice for certain patients with suspected appendical peritonitis.

In the first place, when the diagnosis of appendical peritonitis cannot be established with reasonable certainty, we agree with Gray and MacKenzie [4] and others [5] that, by and large, less harm is done by incision through the abdominal wall of the patient with appendical peritonitis than by omission of exploratory laparotomy in the presence of intestinal obstruction or a small, slowly leaking, perforated peptic ulcer.

We have also long been convinced that even if the abdominal wall is open it is wiser not to remove the appendix in cases of appendical peritonitis if adhesions must be broken down in its removal. This is particularly true, in our opinion, if the process is well walled off. During exploratory laparotomy in such cases appendectomy is done only if the appendix lies immediately beneath the incision and is not adherent to surrounding structures or there is a gross perforation at the base of the appendix through which intestinal contents continue to leak. With appendical peritonitis, as with other conditions, the ultimate outcome depends on the outcome of the conflict between the patient's infection and his defensive powers to overcome it. In our opinion, when exploratory laparotomy reveals an open perforation through which fecal material continues to discharge, appendectomy aids the defense of the body by preventing further peritoneal soiling, but when the perforation and the appendix have been sealed off by omentum and surrounding intestine removal of the appendix, by breaking down the already established defensive measures of the body, may do more harm than good.

Again, if there is any doubt about perforation we advise exploratory laparotomy, for we feel that the damage done by exploratory laparotomy, with or without appendectomy, to the patient with appendical peritonitis is far less than that incurred by allowing an unruptured appendix to go on to perforation. The majority of patients with generalized peritonitis of appendical origin exhibit generalized abdominal pain and tenderness, absence of peristalsis on auscultation of the abdomen, rebound tenderness referred to the point of palpation of the left side of the abdomen, tenderness on both sides on rectal or vaginal examination and distention. (Of these, absence of peristalsis and abdominal distention are, in our experience, the most reliable.) In some patients with appendical peritonitis, however, particularly after localization has begun, one or more of these may be absent and the diagnosis of appendical peritonitis may be extremely difficult to make except by exploratory laparotomy. The converse may occasionally be true, for a patient whose appendix has not ruptured may present signs and symptoms suggestive of appendical peritonitis. This has been observed particularly of patients entering the hospital within twenty-four hours after the onset of their disease, and we have come to feel that the patient with acute appendicitis who enters the hospital within twenty-four hours of the onset is better treated by exploratory laparotomy and, almost without exception, removal of the appendix, regardless of the presence or absence of the clinical signs of perforation and generalized peritonitis. Perforation of the acutely inflamed appendix of a patient entering the hospital within twenty-four hours of the onset of the disease was found in only 4 per cent of the patients seen.

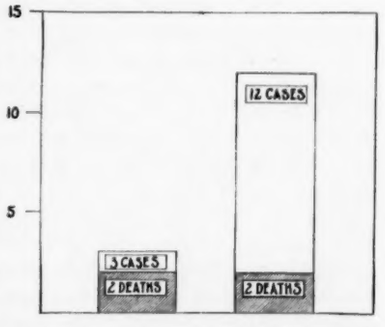

Chart 2.—Data on patients with appendical peritonitis seen within twenty-four hours of the onset. The column at the left represents those given conservative treatment, the column at the right those treated by immediate operation.

In those rare patients with acute appendicitis in whom distention and generalized abdominal tenderness develop within twenty-four hours, the symptoms in our experience have been due more frequently to peritoneal exudate and vigorous catharsis than to gross perforation of the appendix. Another reason for urging appendectomy for these patients is the fact that if the appendix becomes ruptured within twenty-four hours the peritoneal cavity has had little time to prepare for such gross contamination and is poorly prepared to localize the infection. Operation in these circumstances usually shows an open per-

4. Gray, H. K., and MacKenzie, W. C.: Acute Appendicitis: Analysis of Results of Both Operative and Nonoperative Treatment in 674 Consecutive Cases, S. Clin. North America **17**: 971 (Aug.) 1937.

5. Priestley, J. T., and McCormack, C. J.: Generalized Peritonitis Secondary to Rupture of Appendix, with Special Reference to Serum Therapy, Surg., Gynec. & Obst. **63**: 675 (Nov.) 1936.

foration which continues to discharge fecal material into the abdominal cavity, in contradistinction to those occurring from seventy-two to ninety-six hours after the onset of symptoms, which are usually largely sealed by omentum or surrounding intestine. Among the small group of fifteen patients who had acute appendicitis and perforation occurring within twenty-four hours of the onset of their disease, twelve were treated by prompt appendectomy, with two deaths; one of those who died was a boy aged 9 years and the other a woman of 73. Of three patients treated conservatively, two died (chart 2).

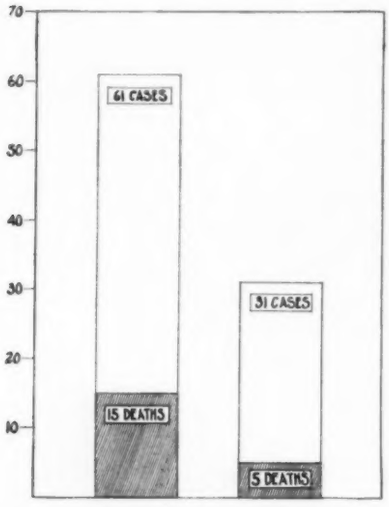

Chart 3.—Data on patients with appendical peritonitis seen within periods varying from twenty-four to seventy-two hours after the onset. The column at the left represents those treated by immediate operation, the column at the right those treated conservatively.

Of the patients entering the hospital between twenty-four and seventy-two hours after the onset of their disease, one in four died when treated by operation; one in six died when treated conservatively (chart 3). Such a statement of mortality, however, may be misleading, because for patients seen within four hours of the time of perforation, when the exact time of perforation can be established, appendectomy may well be the procedure of choice. Performed on patients with very recent perforation, in our experience, appendectomy has usually been followed by recovery.

Of sixty-two patients with appendical peritonitis whose symptoms were of more than three days' duration at the time of entry to the hospital, forty-one were treated conservatively with three deaths (one in fourteen). Twenty-one patients (chart 4) were subjected to prompt appendectomy with ten deaths (one in two).

We agree with Bancroft [6] that it is a grave error to believe that just because a patient is not operated on he is being treated conservatively. Certain definite procedures based on the disturbance of physiologic function, which constantly occurs in patients with this disease,[3] must be carried out if best results are to be expected. Although these measures have been detailed time and again [1] they will be briefly outlined here. The patient must be kept quietly in bed, so that localizing processes are minimally disturbed, a task which may be difficult with children. Too vigorous manipulation or examination may be disastrous. Elevation of the head of the bed will favor localization of secondary abscesses, if any, in the pelvis, where they can be detected and drained easily, rather than in the subphrenic space, where detection and treatment are more difficult.[1] Absolutely nothing by mouth should be given, in order to put the gastrointestinal system at complete functional rest. Distention is minimized by inhalation of concentrated oxygen [7] and constant gastric suction of the type advocated by Wangensteen. Of even greater value in decompressing the small bowel [1] is the double tube suggested by Miller and Abbott. The adynamic ileus accompanying the peritoneal infection can be combated satisfactorily by its use together with continuous suction. Intragastric suction is also used to prevent the accumulation of fluid in a poorly functioning gastrointestinal tract. For the same reasons no food, solid or liquid, is allowed by mouth until gastrointestinal function has become reestablished as evidenced by detection of peristaltic sounds on auscultation of the abdomen. Morphine sulfate at regular intervals, usually one-sixth grain (0.01 Gm.) every three hours, unless the respirations are fewer than 14 per minute, both by its tonic action on the intestine [8] and by its sedative action on the patient, has been found helpful. The fluid and salt balance of the patient is maintained by intravenous infusions twice daily. The administration of adrenal cortex extract is of inestimable value in combating the toxemia and aiding in maintenance of electrolyte balance. If nutrition by mouth must be withheld for a protracted period, multiple small transfusions help to combat anemia and hypoproteinemia. Sulfanilamide as an 0.8 per cent subcutaneous infusion was not used for these patients, but recently we have come to believe it to be of value in the treatment of appendical peritonitis.

An equally important part of the conservative treatment of appendical peritonitis is constant search for and appropriate treatment of secondary intraperitoneal abscesses. (Pylephlebitis and intrahepatic abscess will not be considered.) These will be considered in the inverse order of frequency.

The least frequent secondary intraperitoneal abscess is found in the subphrenic space. It may follow the original infection quickly or only after a prolonged interval. It is probable that infection in the subphrenic space without abscess formation is not infrequent and that it subsides spontaneously. There was one patient in this series of 1,039 who had a subphrenic abscess necessitating drainage. This patient recovered after a prolonged stay in the hospital. In two cases abscesses of the subphrenic space were found at autopsy.

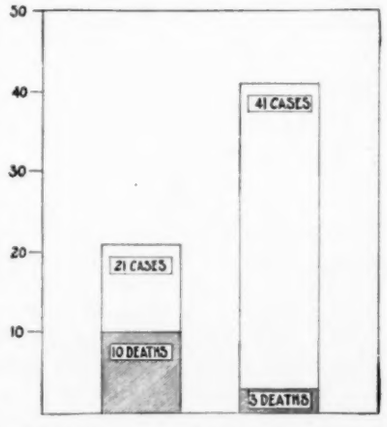

Chart 4.—Data on patients with appendical peritonitis seen more than seventy-two hours after the onset. The column at the right represents those treated conservatively, the column at the left those treated by immediate operation.

Abscesses between the liver and the transverse colon are difficult to detect. In addition to the constitutional symptoms of continued sepsis, a mass in this region may be palpable. Incision is sometimes necessary; a short oblique subcostal incision is sufficient, but it is our impression that the great majority of subhepatic abscesses will subside spontaneously.

6. Bancroft, F. W.: Mortality in Acute Appendicitis, Ann. Surg. **105**: 56 (Jan.) 1937.

7. Fine, Jacob; Hermanson, A. L., and Frehling, Stanley: Further Clinical Experiences with 95 Per Cent O_2 for the Absorption of Air from the Body Tissues, Ann. Surg. **107**: 1 (Jan.) 1938. Haggard.[2]

8. Yonkman, F. F.; Hiebert, J. M., and Singh, Harkishen: Morphine and Intestinal Activity, New England J. Med. **214**: 507 (March 12) 1936. Ochsner, Alton; Gage, I. M., and Cutting, R. A.: Effect of Morphine on the Obstructed Intestine, Arch. Surg. **28**: 406 (Feb.) 1934.

Secondary abscesses in the left iliac fossa, as has been pointed out by one of us, are seen only in those patients with a shallow cul-de-sac, particularly children. Drainage through the left side of the abdominal wall is rarely necessary, for drainage of the associated cul-de-sac infection is usually sufficient for both.

Secondary infection in the cul-de-sac is, in our opinion, an almost constant companion to generalized peritonitis of appendical origin. Not a few such instances go on to abscess formation, but in many patients the induration and pain felt on rectal examination will subside spontaneously. Besides the constitutional signs and symptoms of continued sepsis, the patient with an abscess of the cul-de-sac has a loss of tone of the rectal sphincter as well as a boggy, fluctuant mass palpable on rectal examination. In the male patient, retention of urine may be the first symptom of an abscess of the cul-de-sac. Drainage through the rectum preceded by catheterization of the bladder and aspiration of the abscess has been satisfactory. An abscess in the right iliac fossa can be almost always palpated. In some instances such an abscess may attain tremendous size and yet give the patient no discomfort, either local or constitutional. In other instances a relatively small abscess in the right iliac fossa may be associated with severe systemic toxemia and demand drainage. Our experience has been similar to that of Lehman and Parker,[9] who advise delay in operation until intervention is forced by a rising pulse and increasing fever, not only because the majority of such abscesses will resolve spontaneously but because a rather large mass in this region may be composed of indurated and inflamed mesentery and omentum and adherent loops of bowel with but little purulent material. When drainage has been necessary the McBurney incision and the extraperitoneal approach have been used.

SUMMARY AND CONCLUSIONS

In 860 of a series of 1,039 patients with acute appendicitis the disease was confined to the appendix; in 179 it had extended to the general peritoneal cavity.

The mortality among patients in whom the disease was confined to the appendix was 0.8 per cent; among those with appendical peritonitis it was 27.3 per cent.

Of fifteen patients with appendical peritonitis seen within twenty-four hours of the onset of symptoms, twelve were treated by prompt appendectomy with three deaths, and three by conservative measures with two deaths.

Of ninety-two patients with appendical peritonitis who entered the hospital from twenty-four to seventy-two hours after the onset of symptoms, sixty-one were treated by immediate operation with fifteen deaths; thirty-one were treated conservatively with five deaths.

Of sixty-two patients with appendical peritonitis with symptoms of more than three days' duration, twenty-one were subjected to immediate appendectomy with ten deaths and forty-one were treated conservatively with three deaths.

We feel that exploratory laparotomy is a wiser procedure than conservative measures in cases in which the diagnosis of acute appendicitis cannot be established with reasonable certainty or there is any doubt about perforation of the inflamed appendix and also for those seen within twenty-four hours of the onset of symptoms, although these factors are not subject to statistical proof on the basis of the material at hand.

190 North Upper Street.

9. Lehman, E. C., and Parker, W. H.: The Treatment of Intraperitoneal Abscess Arising from Appendicitis, Ann. Surg. **108**: 833 (Nov.) 1938.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MILLER, FELL, BROCK AND TODD, DRS. STAFFORD AND SPRONG AND DRS. BARROW AND OCHSNER

DR. ALTON OCHSNER, New Orleans: The perennial question of the treatment of appendicitis has come up. There is this controversy concerning the treatment of appendical peritonitis but there is no controversy concerning the treatment of appendicitis per se. Even most ardent advocates of the conservative treatment of appendical peritonitis have emphasized the importance of immediate operation in uncomplicated appendicitis. Fortunately this morning no one has used the term "conservative treatment of appendicitis." The conservative treatment is limited to the treatment of appendical peritonitis. The statistics of Drs. Stafford and Sprong certainly are splendid, and one cannot deny the good results that they obtained. In Louisiana we feel that we have a somewhat different problem possibly from that which they have in Baltimore. Many of our patients come long distances from the bayous in southwestern Louisiana and practically all have had catharsis. Rupture is therefore usually present. The conservative treatment of appendical peritonitis is extremely difficult and the man who does occasional surgery will do far better by operating on these patients immediately irrespective of the time they are seen. We are convinced too that if there is any question about the advisability of operation or any question about the localization of the process the patient should be operated on. It is far better to operate on the patient unnecessarily and leave the abscess alone, back out, although it takes a great deal of courage to do it, than to overlook the possibility of a spreading infection. We are convinced that there are patients with a localizing disease, not a spreading peritonitis (every patient with a spreading peritonitis, unless moribund, should be operated on), who are better treated conservatively than operated on immediately. The difficulty is in the diagnosis. There is nothing that requires more surgical skill and judgment in distinguishing between these two groups of cases. If there is a definite localization as compared with a generalized tenderness, we believe that the case should be treated conservatively. These patients require a great deal more care subsequently. The incidence of intraperitoneal abscess is greater. Dr. Barrow has emphasized the importance of looking for these abscesses in particular locations. They are not difficult to diagnose if one will think of their possible occurrence. These patients should have rectal examinations done every other day at least, and many of the infections will subside spontaneously; but once the abscess has developed, it must be drained.

DR. E. H. FELL, Chicago: It has been of interest to note how much the papers have been similar in thought. However, Dr. Miller and his associates felt very definitely that all appendical abscesses should be treated conservatively and in that group which was treated conservatively only 2.5 per cent mortality occurred. I differ with Drs. Stafford and Sprong, and in their group which were operated on they had a mortality of 7 per cent. All patients with spreading peritonitis should be operated on and, I believe, should receive a very careful preoperative preparation. I do not take them from the examining room up to the operating room; their fluids should be balanced and blood given when needed. These important parts of the treatment of peritonitis are the preoperative and postoperative maintenance of fluids, proteins and electrolytic balences. In amplification of what Dr. Miller and his co-workers have said, I wish to call attention to four points: 1. Occasionally a definite palpable acutely tender mass may be present in the right lower quadrant during the early hours of an attack before a perforation has occurred, which is due to the omentum wrapping itself about the acutely inflamed appendix. Under these circumstances it would be unwise to follow the general rule as to conservation, and I believe that immediate operation is definitely indicated. 2. At times the clinical picture of an appendical abscess may be closely simulated by something which demands immediate surgery. I refer particularly to an atypical intussusception which has been present for some time. 3. Not every case of spreading or general peri-

tonitis which apparently is due to a ruptured appendix is necessarily of appendical origin and therefore surgical intervention may occasionally be carried out when a conservative course would have been the wise policy. I refer to hematogenous peritonitis. 4. The patients in group 2 who have returned for appendectomy during the quiet interval, that is three months after the disappearance of a palpable mass, have shown at operation a variable pathologic type. Most times there have been a few adhesions between the appendix and the adjacent structures. Occasionally the appendix is embedded in a dense mass of adhesions and is difficult to remove. At times a small sterile abscess remains. The point I wish to make is this: In my experience, no matter how extensive is the pathologic condition, the operation can be carried out safely at this time without a mortality.

DR. HARVEY B. STONE, Baltimore: There has come to my attention, as one who frequently has to examine young surgeons for the American Board of Surgery, a keen recognition of the chaotic state of opinion as regards the handling of certain phases of appendicitis and its complications. Dr. Ochsner in his discussion has done well to point out that the controversy does not concern the handling of appendicitis per se, that there is no division of opinion as to the method in which simple acute appendicitis should be handled; we are all agreed that the only safe way to deal with that condition is by immediate operation. The variations in points of view arise when further complications of the original appendicitis have taken place, and particularly in those two groups of cases in which abscess has formed or in which a spreading peritonitis of varying degrees of intensity has developed. Perhaps the best discussion that one can make is to give his own point of view. I would agree with the paper of Dr. Miller and his co-workers almost in toto except for one point. They say that appendix abscess should not be operated on. If they would modify that by saying that appendicitis with abscess formation need not necessarily be operated on immediately, I would be willing to agree. I cannot feel that full obligation has been carried out to the patient in permitting him to go home without some certain knowledge that he will return or, better still, removal of his affected appendix before he is permitted to leave the hospital. The qualifications that Dr. Ochsner has placed about his advocacy of deferred surgical treatment of certain forms of acute appendicitis are very necessary, but it does not remove the basic objection to that form of treatment. He is careful to say that the postponement of operation is only a part of the treatment, that the rehabilitative measures which accompany the delay are fully as important a part of the treatment. I would like to submit the question as to whether the advantage which the patient obtains under this method of treatment is not due entirely to the rehabilitative measures and not to the delay. I cannot believe that this great concern to avoid intervention with a diseased appendix is justified in view of his apparent willingness to leave such a diseased appendix continuing in the abdomen. It seems to me that the basic principle of treatment of advanced disease of the appendix is the removal of the diseased organ and that the employment of the rehabilitative measures is important accessory treatment but does not get to the base of the trouble.

DR. JOHN S. HORSLEY JR., Richmond, Va.: I particularly want to endorse what Drs. Stafford and Sprong said and what Dr. Harvey Stone emphasized in his discussion. Of the appendectomies done as the main procedure at our hospital in Richmond, Va., from Jan. 1, 1931, to June 1, 1940, there were 706 cases of acute appendicitis with five deaths and none of those were due to peritonitis, a mortality of 0.71 per cent. There were 133 cases of acute appendicitis with peritonitis with three deaths, a mortality of 2.26 per cent. There were 258 cases of subacute and chronic appendicitis with no deaths. There was one case of carcinoma of the appendix. A total of 1,098 consecutive cases were done mainly for appendicitis with eight deaths, only one of which was due to peritonitis, and that was an abscess case, a total mortality of 0.7 per cent. With regard to acute appendicitis, ruptured and unruptured, there were 706 cases of the acute form with five deaths, 0.7 per cent mortality. There were ninety-one cases of acute perforated appendicitis classified as abscessed and localized peritonitis with one death, and that was due to a spreading peritonitis, a mortality of 1.1 per cent. There were forty-two cases of generalized spreading peritonitis with two deaths, a mortality of 4.7 per cent. In the spreading peritonitis group the first patient had 2 feet of gangrenous bowel at the time of operation which needed resection, and the second patient in this group died four weeks after operation from pulmonary embolism. These operations have been done by three operators, three Horsleys, father and two sons, in one hospital and have been followed carefully and accurately. Based on these statistics we have come to a five point program which summarizes our ideas about the treatment of acute appendicitis, both ruptured and unruptured: 1. Immediate operation as soon as the diagnosis is made, no matter what the stage of the disease, whether abscess, general peritonitis or unruptured. 2. A small McBurney incision, with gentle handling of the tissues, and always removal of the appendix. In this group of 1,098 cases the appendix was removed in every instance at the original operation. 3. Use of suction apparatus instead of sponging to remove any fluid in those that have had a perforation. 4. Physiologic rest of the affected colon by avoiding proctoclysis and giving intravenously dextrose in Ringer's solution, using a Jutte or Abbott tube for decompression of the stomach and using a minimum of drainage. We have been using fewer and fewer drains until in the more recent months we have been closing many of the abdomens in cases of perforation without drainage except for the abdominal wall. 5. Simple treatment of the stump of the appendix, merely ligating the stump and bringing over a tag of peritoneum-covered fat to protect the stump from the drainage tube and any complicating adhesions.

DR. JOHN J. GILBRIDE, Philadelphia: It has been shown here that many conditions add to the mortality rate in acute appendicitis. An appendix that occupies an unusual position makes it very difficult sometimes to arrive at a correct diagnosis. In each of three cases in which the appendix was adherent to the urinary bladder the symptoms were largely those of vesical tenesmus, pain in the urinary bladder associated with pain and tenderness in the right lower quadrant. Pain and tenderness in the right lower quadrant led me to make a tentative diagnosis that the condition was one of appendicitis. Cystoscopic examination by skilled cystoscopists in each instance showed an area of hyperemia in the posterior superior wall of the bladder. The size of that area varied from 0.5 to 1 cm. The appendix was removed at operation and it was found to be adherent to the urinary bladder. It had not perforated into the bladder.

DR. EDWIN M. MILLER, Chicago: The greatest thing in surgery, as I see it, is surgical judgment. I would hesitate to question the surgical judgment of men like Dr. Harvey Stone, Dr. Ochsner, Dr. Stafford or Dr. Horsley but with some of the statements they have made we cannot agree. We wish to emphasize strongly that for patients in what we call group 2 with evidence of perforation, against which there has been established an adequate defense as demonstrable clinically by palpation of a definite local appendical mass (I don't say abscess) we believe that the conservative policy is by far the safest procedure, because we have plenty of evidence to show that in over 90 per cent of such patients careful observation, day after day, will show that the appendical mass will spontaneously subside and completely disappear; that only a few patients, less than 5 per cent in that group, will develop what is unquestionably a definite abscess that demands surgical drainage. I cannot agree with Dr. Horsley in his position when he says that not only should all such patients (i. e., those with an appendical mass) be operated on but that the appendix must always be removed. In my opinion such a procedure is dangerous. Many times the pathologic condition is localized to the tip of the appendix, around which the abscess has developed. Two thirds or more of that appendix may lie entirely outside the walls of that localized mass, and to attempt to remove that appendix at the time of the acute process is only courting trouble.

HEALTH INFORMATION, PLEASE

HOMER N. CALVER
Secretary, American Museum of Health, Inc.
NEW YORK

A few weeks ago Amos and Andy were discussing the medical examination which Amos had just taken. They were agreed that a "catabolism" test did one a lot of good but were uncertain what it cured.

Few of us who are engaged in medicine or public health realize how meaningless to others are the words we constantly use and how incomprehensible are the processes of thought which we habitually follow. The bewilderment of the financier over a medical report, however, is similar to our bewilderment in a maze of figures. For instance, the following excerpt from a report to the stockholders of the ABC Company gives little reward for our efforts to decipher it from the small type in which it is printed:

> To provide for the accounting adjustments above described all the corporate surpluses, both earned and capital, of ABC Company as of January 1, 1939, in the amount of approximately $75,500,000, and the then existing reserve against certain investments, amounting to approximately $6,500,000, will first be used, and then the new additional capital surplus created by the reduction in the stated value of the common stock, amounting approximately to $134,700,000, will be utilized to the extent necessary.

Considerable knowledge of accounting practice is needed to elicit information from this sentence, even after careful study. It illustrates how wide the gulf is between the specialist and the layman. Further illustrations appear in Tonics and Sedatives every week.

The medical profession itself has been a principal contributor to this popular ignorance of medical matters. Unconsciously it has for the most part and until lately been bound by the tradition of the "medicine man," who practiced his mysteries to impress his tribe. I stress the word unconsciously because this picture of esoteric aloofness is not compatible with the concept of the true physician. Every doctor has been repeatedly reminded that his title means "teacher." Yet as far as I know medical schools never give him any training in how to teach. He is like an artilleryman with a magnificent supply of ammunition who has never been shown how to load, aim and fire a cannon. In his efforts to acquire these technics for himself it is not surprising if he is sometimes injured in a backfire.

This reluctance of the medical profession to take the public into its confidence has had at least three adverse effects on the profession itself. First, just as weeds will grow where crops are not planted, it has left the field open for the quack and the charlatan. To the layman without medical knowledge the jargon of the pseudoscientist is indistinguishable from the learned discourse of the physician. "Catabolism" sounds just as impressive as metabolism. The doctor must learn to talk in terms the public cannot misunderstand or else teach the public to understand the terms he uses.

Second, a man who does not understand the necessity for medical service or who is not aware of the resources which medical science offers is not likely to seek medical care even when he can afford to pay for it. Other public services based on science have met this problem with benefit to themselves. The telephone company does not talk to the public in terms of dynes and ergs and ohms. It says "Speak directly into the mouthpiece." "Hold the receiver close to the ear." "Answer the telephone promptly." With the dial telephone, it has even taught us to be switchboard operators. Increased familiarity with this utility promotes increased use. The same has been true of the automobile, the radio and the electric light. It can be true for medical service also. Many a physician already will tell you he has had increased demands for diphtheria immunizations after a public campaign for diphtheria prevention. Such results can be extended to cover the whole field of medical practice.

A third adversity which the profession must now face, partly as the result of its own negligence, is a flood of propaganda for new systems of medical care. Though better and more widespread health education may not have prevented this social development, the proposals themselves would be based on a greater appreciation of the realities if the proponents always knew what they were talking about. It is perhaps significant that government efforts to regulate the telephone monopoly have not made much progress.

To a considerable extent a program of health education is a public relations program for the medical profession and its allied workers. In a democracy such programs to be effective must reach a large proportion of the whole mass of people. They must be as intense and as far reaching as the preparations of a dictator for war. Indeed, mass health education is a necessary step in the totalitarian war against disease, which it is high time we began. One wonders whether in the next draft the physical condition of our young men will prove to be any better than it was last time. The mobilization of a whole population for a total war against disease and preventable death is not a small task. It must have greater breadth and depth than is represented by the present trickle of pamphlets, lectures, radio talks and motion pictures, however excellent these may be individually. The situation calls for a better integration of effort, more well trained leaders, a better understanding and use of available technics and a large increase in financial support.

The museum of health is conceived to be an important instrument in this necessary program of preparedness and engagement. The program calls for not just one museum, such as the American Museum of Health which you can see in the initial and more obvious phases of its operation at the New York World's Fair, or such as the Cleveland Museum of Health and Hygiene, which will open its doors to the public this year, but for many museums spread throughout the country like a vast division of heavy tanks, each with its own board of directors, employees and funds, and a program devised to meet the dispositions of the enemy in its territory. In each locality the medical profession must take a leading part in the creations of such museums, as it has in New York and Cleveland.

The American Museum of Health in New York was the result of some ten years of planning. It is now in its second year of operation. Its sole activity thus far has been to prepare and present a popular exhibit on medicine and public health at the New York World's Fair. It has plans for a large number of other activities

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in line with its objectives as an institutional headquarters for mass education in health. It has already collaborated and hopes to extend its collaboration with national and local professional, voluntary and official health and medical organizations and a number of other agencies. It has adhered to the principle that showmanship and science are of equal importance, and that failure will result if either is made subservient to the other.

THE VISITOR REACTION STUDY AND SUPPLEMENTAL INVESTIGATIONS

A serious and justifiable criticism of health exhibits as well as all health education activities is that the good they do is unknown. The health educator has not in general attempted to demonstrate that his work has saved lives, as the laboratory man has shown that his service has prevented disease. Results have been reported in terms of subjective opinion which were not supported with objective data. When the American Museum of Health embarked on its work, therefore, it at once set up plans for a study of its own operation and of the public who were its patrons.[1] This plan was organized as a "Visitor Reaction Study," which operated chiefly at the New York World's Fair. Similar supplemental studies are being carried on this year in both the New York and the San Francisco fairs.

The Visitor Reaction Study included a dozen or more test procedures devised by Dr. Mayhew Derryberry[2] and his associates and applied to more than 50,000 visitors. No one person was given all the tests, and no one test was given to everybody. In each case the test was used with a sufficiently large group so that the results would be statistically significant. Analysis of this enormous volume of data will not be complete until this fall. Some tentative observations can be made now, however, on the basis of some analyses completed or in progress. It is to be emphasized that these observations are necessarily tentative and subject to amendment when the study of the data is completed.

From the opening day, when 60,000 visitors were clocked in, it was obvious that the exhibit would be a major attraction. When the fair closed on a rainy Hallowe'en, the Medicine and Public Health Building had rolled up a total attendance of more than 7,500,000. Of this it is estimated that 5,542,000 visited the Hall of Man and 4,947,000 visited the Hall of Medical Science. An analysis of fifty-two exhibit units in the Hall of Man showed that the number of visitors who stopped to look at the four most popular exhibits were, in round figures, Transparent Man, 3,340,000; Embryo Panel, 2,302,000; First Year of Life, 2,161,000; Maze of Superstition, 2,115,000. Least popular were four panels representing the organs of smell, the mechanics of hearing, the organs of taste and the mechanics of vision. These exhibits had only from 123,000 to 189,000 apiece. The number of visitors to the twenty-five exhibits in the Hall of Medical Science showed that the most popular were Anesthesia, 1,143,000; Carrel-Lindbergh Culture of Organs, 1,397,000; Education of the Blind, 1,369,000; Cancer, 1,289,000. The least popular were Mental Hygiene, 439,000; Safeguarding Medical Products, 361,000; Social Hygiene, 351,000; Industrial Sanitation, 243,000.

Our studies, however, were not confined to a mere counting of visitors. The exhibits were rated according to choice by approximately 20,000 visitors, and these ratings are being compared with similar ratings by three hundred experts. Comments were solicited from time to time and a record was kept of unsolicited comments made to the attendants. Tests were made which indicated the general level of health information of the public, and these data are being analyzed with respect to age, sex and other factors. Experiments were undertaken to determine the reading difficulty of legends. In many instances it was extraordinarily difficult to write a legend which was scientifically satisfactory as well as popularly understandable.

In the course of the study an attempt was made to ascertain what subjects the public would like to see treated in exhibits. Six subjects which were not covered and about which there had been frequent inquiry were submitted to some 20,000 individuals with this question: "Would you be interested in seeing an exhibit on the following subjects? Please check." The number checking these six topics were: Birth Control, 54 per cent; Need for Periodic Health Examinations, 46 per cent; Hospital Insurance, 39 per cent; Abortion, 33 per cent; Compulsory Health Insurance, 29 per cent; Arthritis, 26 per cent.

As might be expected, the age of the visitor determined to a striking extent his interest. As age increased there was a marked increase in the percentage of persons interested in periodic health examinations and arthritis and a less marked but nevertheless appreciable increase in the percentage interested in hospital and compulsory health insurance. Excepting in the 21 to 30 age group, age is inversely correlated with the proportion of individuals interested in exhibits on birth control and abortion. There were also interesting sex differences. More females than males were interested in arthritis, and this disparity in interest increased with age. More males than females were interested in compulsory health insurance, and this difference in interest remained approximately constant as age increased. In the under 21 age group the percentage of females interested in birth control and abortion was significantly higher than the male, but this sex difference was not apparent in the older age groups. Since no data are available on the actual age distribution of visitors to the Medicine and Public Health Building, deductions should be made with caution from the total percentage figures.

At the same time, visitors were given an opportunity to suggest other subjects. The answers to approximately 1,600 suggestions have been grouped into ten categories. The category which had to do with diseases exceeded all others by two to one, but it will interest this group to know that the second largest category was that which included the various replies dealing with some aspect of medical training and organized medical service.

The question has been raised whether or not health exhibits contribute to hypochondria. An effort to answer this question was made through the Gallup poll technic. Trained interviewers asked 1,000 individuals "Has looking at these exhibits suggested to you that you might have some condition that needs correction?" Approximately 10 per cent replied in the affirmative. Some of them admitted that they were concerned about themselves before they saw the exhibits. Others indicated that they were sufficiently disturbed to consult

1. For this purpose the museum was fortunate in securing funds from the Carnegie Corporation of New York, the active collaboration of the U. S. Public Health Service, and material assistance from the New York World's Fair, the National Youth Administration, the Works Progress Administration and a large number of other organizations and individuals.

2. Senior Public Health Statistician, U. S. Public Health Service.

a physician—which might be classed as a desirable result. The final comparison of the data with the normal hypochondria rate—if there is such a thing—should prove interesting. In any event, no epidemic of hypochondriasis has since been reported.

With one exception no diagnostic procedures were included in the exhibits. This exception was the rapid chest x-ray survey conducted by the Queens County Medical Society. In this exhibit more than 11,000 paper roentgenograms were made. Readings of all these were done by specialists in this field designated by the county medical society. Negative results were reported directly to the patient with an appropriate word of caution, and positive readings were referred to the patient's family physician with a letter of explanation. Reports of the radiologists indicated that a little better than 3 per cent of the roentgenograms showed pulmonary tuberculosis which was probably active in the first, second or third stages.

One of the most important questions we set ourselves to answer was "What did the public learn from the exhibits?" Some 30,000 people were asked to fill out test blanks on each of which were twenty-five questions relating to health. Some of these questions were based on the exhibits and some were not. Some people answered the questions before they had seen the exhibits, and others answered them after they had seen the exhibits. Those who had seen an exhibit made significantly higher scores on the test questions relating to that exhibit than those who had not seen the exhibit, with the exception of one exhibit.

From the analysis of this material, we are accumulating a wealth of valuable corollary data and learning that some exhibit technics are ineffective. For instance, it would seem that certain types of statistical facts are not easily absorbed and may by their method of presentation give a wrong impression.

Some preliminary analyses indicate that the pneumonia exhibit failed to register the fact that rusty sputum is a symptom of pneumonia, and the cancer exhibit was not getting across the idea that surgery and x-rays were acceptable methods of treating cancer. In other words, we had abundant evidence that there were good ways and poor ways of telling our story. Things that seemed so clear to us in the words, pictures and charts were sometimes considerably less than clear to many people.

A report of the Visitor Reaction Study will be published this winter. Representing as it will a sampling of 7,500,000 people, it should be of enormous value to all who are engaged in health education or exhibit planning in any field.

Our experience already warrants several conclusions:

1. The people thirst for knowledge about themselves.
2. It cannot be assumed that those who have this knowledge are able to give it to the public in a way it will understand. Study and elaboration of effective technics for imparting medical and health information through exhibits and otherwise are needed.
3. It has been demonstrated that the museum of health is an effective instrument for mass education for health.
4. It is a fair deduction from experience in other fields that increased popular knowledge of medical matters will result in increased use of medical service.

The members of the American Medical Association have a great opportunity to benefit the public as well as their profession if they will take the leadership in their communities in the development of museums of health which constantly test their health education programs objectively for results.

30 Rockefeller Plaza.

ABSTRACT OF DISCUSSION

DR. HARRISON S. MARTLAND, Newark, N. J.: I first met Mr. Calver at the time he was planning and organizing the New York World's Fair medical exhibits. While directing these public health exhibits he has had a unique opportunity to demonstrate the popularity, value and necessity of permanent public health museums for lay education. Further evidence of the popularity of lay medical exhibits has been demonstrated this year in Essex County, N. J. The president of the county medical society at the time, Dr. Royal A. Schaaf, felt that lay education was a most important function of a county society. He said "Why not have a Medical Week." We did that. There were over forty exhibits covering such subjects as cancer, pneumonia, fractures, first aid, endocrinology, vitamins, pediatrics, obstetrics, allergy, hygiene, serums and antitoxins, instruments of precision as employed in medicine, blood transfusions and operating room technic. The exhibit on the value of autopsies was most unusual. Letters from leading Catholic, Jewish and Protestant clergymen were prominently displayed. These letters indicated that there were no religious objections to the properly performed autopsy and were read with great interest by the public. Medical motion pictures of general interest were continuously shown and special lectures for the laity were given. The speakers were prominent physicians from other parts of the country. The exhibits were in charge of nurses, technicians or interns, and all publicity as far as personal medical advertising was concerned was prevented. During the week in a community of about 900,000 the exhibit, which had been widely advertised in the newspapers and stores, drew over 40,000 people. On one day alone 13,500 attended the exhibits, and at one of the evening lectures more than 1,500 had to be turned away. We feel that two main objectives were attained: First, to demonstrate to the community that the county society is also an educational institution and not a selfish economic body. Second, to gain the good will of the public for organized medicine. Of course in an exhibit of this type there are many pitfalls, and diplomacy is necessary. At the end of the exhibit, however, we felt that the attempt was well worth while and would accomplish more than the many other efforts to combat quackery, cultism and unworkable social changes in the patient-doctor relationship. There is a real necessity for adequate permanent public health exhibits, and these may by education solve many of the public relation problems now besetting the medical profession.

MR. HOMER N. CALVER, New York: Dr. Martland's report of what they did in Essex County suggests what other county medical societies can do in this direction. I should like to emphasize that the situation calls for more than sporadic or temporary effort, as illustrated in a one week or two week exhibit. Disease doesn't attack one week or two weeks at a time. It is with us always, and we see the museum of health, as distinguished from the temporary exhibit, as an institution which will continuously wage war against ill health as the exhibit does temporarily. I should like to express our profound gratitude to some 300 to 400 leaders in the medical profession whose time-consuming effort made possible this show we now have. They met, I assure you, often and long, and without their guidance this project could never have been launched.

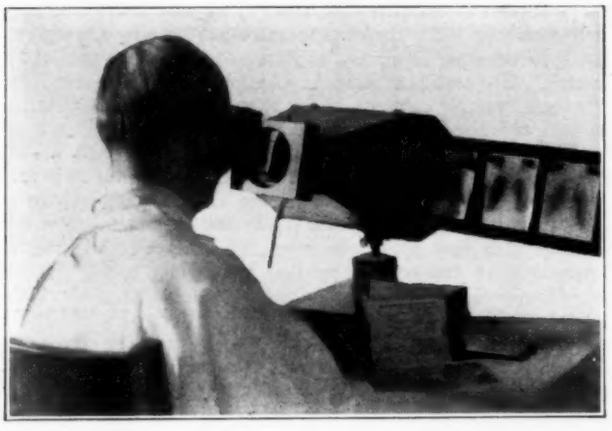
Relaxation.—The benefits to be gained from frequent periods of relaxation are by no means fully appreciated by the majority of people. To lie down for a few minutes after lunch and relax, even though we do not actually lose consciousness, will drop the blood pressure and pulse rate, remove the feeling of being rushed or harassed, and fit the individual for his afternoon's work to an extent considerably out of proportion to the time expended for the purpose.—Smiley, Dean Franklin, and Gould, Adrian Gordon: A College Textbook of Hygiene, New York, Macmillan Company, 1940.

THE MINIATURE X-RAY FILM IN THE "TOTAL SURVEY"

FREDERICK TICE, M.D.
President, Board of Directors, Municipal Tuberculosis Sanitarium
CHICAGO

The necessity for a "total x-ray survey" in certain areas of high mortality in Chicago has long been realized. By total survey is meant survey, in the district selected, of every man, woman and child, reaching toward an ideal though probably unobtainable objective of 100 per cent. The reasons for such an effort were compellent. In Chicago the tuberculosis problem, largely enclosed in the Negro (281.7 per hundred thousand mortality against 34.0 per hundred thousand mortality in the white population) is, to a certain extent, geographically circumscribed. In 1939 six predominantly Negro census districts, with 17.5 per cent of the population, accounted for 47.8 per cent of the tuberculosis deaths.

An x-ray project of the magnitude indicated was far beyond our means in terms of the standard film and the project, necessarily, was held in abeyance. Finally,



View box for miniature x-ray films.

with the advent of x-ray photography, practically initiated by Manoel De Abreu of Rio de Janeiro, introduced in this country by Lindberg and Potter, came the answer to our problem. In the work being reported here the photoroentgenographic unit developed by one of the equipment houses in collaboration with Potter, reported elsewhere by Potter and Douglas, was used throughout. The size of the film is 4 by 5 inches and the approximate cost of each film is 5 cents. In the perfection of this photoroentgenographic unit the Municipal Tuberculosis Sanitarium demonstrated its interest and cooperation by referral of the tuberculous and nontuberculous cases necessary for the experiment.

For purposes of the total survey, the photoroentgenographic apparatus was installed in a mobile x-ray unit, already in our possession. This unit consists of standard x-ray equipment, complete with dressing rooms, ventilators and fans, mounted on a balloon-tired 2½ ton truck and supplied with 200 feet of cable for connection with the power outlets.

PROCEDURE AND ORGANIZATION

X-ray examination within easy walking distance was a prime objective. The prospects would not walk long distances. Neither, as we knew from experience, would they or could they use the street cars. Owing to economic conditions prevalent in the areas to be surveyed, the carfare, involving rides for all the members of the family, was in itself prohibitory. It resolved itself therefore into a question of the mountain and Mahomet.

Laying out the work in accordance with this idea, Census District 35 (highest mortality area in the city) was surveyed and stations were so selected that the patients living farthest away would have to walk only a few blocks. Many lived in the same block, around the corner or across the street. The response to our request for free space and facilities was encouraging. Such organizations as the Y. M. C. A., other municipal clinics, welfare organizations, factories, even a police station, were approached and offered cooperation. The location first chosen was the Negro Y. M. C. A., situated in the heart of this area of high mortality.

Preceding the actual work at the Y there was, of course, the usual publicity and educational build-up. Employed and exploited to the full were such mediums as the local newspapers, posters, trailers in the local movie houses, radio talks and brisk liaison with such organizations as the medical society, insurance companies, funeral aid societies, the churches, welfare groups and others.

Contemporaneous with the campaign of education and publicity, ten field nurses were assigned to make an intensive house to house canvass of the one-half square mile immediately surrounding the Y. These nurses further enhanced the publicity, established a building record and family count, furnished assignments for x-ray examination and prosecuted the follow-up. The truck, at the first assignment, was in operation seven days a week, including Sunday, from 1 to 9 p. m. Daily attendance ran from a low of 100 to a high of 300. The entire family was urged to report at the unit and repetitive nurses' visits supplemented with form letters continued the stimulus. Starting April 15, 1940, 10,000 patients had been filmed by June 20, and this report was organized to include data of patients examined to June 18.

X-RAY INTERPRETATION

To avoid individualistic trends, the films were read by a committee of four head physicians, all especially experienced in x-ray interpretation. Opinion had to be unanimous on every diagnosed case. If one member of the committee disagreed, the case was classed as "suspect" and a 14 by 17 film ordered. In addition, all films showing suspicious or abnormal markings were classed as suspects and similarly followed up.

With regard to the technic of film examination, the hand glass, used at first, was found to be tiring to the eyes and unsatisfactory. Owing to the fact that the development was new, no view box for the 4 by 5 films was available. Urged by necessity, the Superintendent of Clinics designed a box which has given excellent results. The apparatus, shown in the accompanying illustration, is a double cone shaped box 22 inches long with a 4 inch magnifying glass at the anterior apex. A runner 30 inches long, capable of holding six miniatures, is part of the equipment. This runner is loaded by an assistant and the films are passed rapidly across the illuminated opening in the face of the posterior cone. The magnified image is about 8 by 10, is easy on the eyes and shows a fine differentiation of detail. For the convenience of the committee, the arrangement is mounted on a swivel base so that the viewing apparatus can be quickly rotated to each examiner in turn.

FORMS AND STATISTICS

The statistical material covering the primary examination is compiled on both sides of the small manila envelop used to hold the miniatures. The front of the envelop contains the identifying data, the back the diagnosis, classification and other items. Several other forms are used, including the housing record to show the number of residents per house or flat, assignment blanks, a form letter of notification to all negative cases and a form letter for reference of nontuberculous conditions. All diagnosed and suspected cases are fully charted in the usual way and subjected to clinic supervision. All plates read as tuberculous are sent immediately to the extramural collapse clinic for study concerning the possibility of ambulant pneumothorax. As a side issue and as a phase of social service work, patients showing cardiac or nontuberculous pulmonary conditions are referred to the indicated clinics.

RESULTS

Of the 10,000 cases in which x-ray films were made to June 18, 1940, 9,348 were fully analyzed and charted. Of these cases 8,942 were of Negroes, 340 of white persons, thirty-four of Mexicans and thirty-two of others. Table 1 furnishes the breakdown according to race and sex.

The principal highlight in this tabulation centers on the 351 cases of "reinfection type" tuberculosis discovered. To these may be added the forty-five cases read as suspects on the original miniature and diagnosed as tuberculous in later films. The addition of the forty-five cases raises the percentage of roentgenologically demonstrable tuberculosis found from 3.75 per cent to 4.24 per cent. In comparison with mass surveys reported elsewhere, the percentage seemed rather high. It must be remembered, however, that the district surveyed represents the area of highest mortality in Chicago, 301.6 per hundred thousand. In such a district, surveyed in a routine manner, one may expect an unduly high morbidity in terms of demonstrable disease. As a matter of fact and with reference to both white and Negro, it may be presumed that follow-up and later x-ray examination of the large "suspect reinfection" group will increase the disease incidence above the figures given.

TABLE 1.—*Results by Race and Sex of 9,348 X-Ray Examinations*

Race	Total Examined	Reinfection Type		Suspected Reinfection		Negative for Reinfection Type	
		No.	%	No.	%	No.	%
Negro							
Male	3,901	150	3.85	288	7.38	3,463	88.77
Female	5,041	181	3.59	360	7.14	4,500	89.27
Total	8,942	331	3.71	648	7.24	7,963	89.05
White							
Male	165	11	6.67	14	8.48	140	84.85
Female	175	7	4.00	15	8.57	153	87.43
Total	340	18	5.29	29	8.53	293	86.18
Mexican							
Male	15	1	6.67	0	....	14	93.33
Female	19	1	5.26	1	5.26	17	89.48
Total	34	2	5.88	1	2.94	31	91.18
Other races							
Male	22	0	....	2	9.09	20	90.91
Female	10	0	....	0	....	10	100.00
Total	32	0	....	2	6.25	30	93.75
Totals	9,348	351	3.75	680	7.27	8,317	88.98

The disease incidence of 5.29 per cent in the 340 white persons examined, against the 3.71 per cent in the 8,942 Negroes examined, is interesting from the fact that the rates run counter to the usual concept. To all intents and purposes the white persons examined in the present survey live under the same sociologic, environmental and economic conditions as the Negroes. Are the rates, as quoted, merely accidental or do they adumbrate an actuality? The number of white persons in the 10,000 x-ray examinations is too small to justify any basis for conclusions. In the course of a year, with seventy or a hundred thousand total x-ray examinations, including possibly four or five thousand white persons, the figures in final analysis should throw some light on a highly debatable question, the relative disease incidence between Negroes and white persons in similar economic brackets.

TABLE 2.—*Negro Cases: Analysis by Age and Sex*

Ages	Total X-Ray Examinations			Reinfection Cases: Number			Reinfection Cases: Per Cent		
	Male	Female	Total	Male	Female	Total	Male	Female	Average
14 years and under	1,433	1,525	2,958	9	15	24	0.6	1.0	0.8
15 to 19 years	396	477	873	17	20	37	4.3	4.2	4.2
20 to 24 years	239	387	626	9	23	32	3.7	5.9	5.1
25 to 29 years	280	458	738	10	22	32	3.6	4.8	4.3
30 to 34 years	265	480	745	14	16	30	5.2	3.3	4.0
35 to 39 years	267	422	689	11	16	27	4.1	3.8	3.9
40 to 44 years	265	389	654	12	20	32	4.5	5.1	4.9
45 to 49 years	211	300	511	14	10	24	6.6	3.3	4.7
50 to 54 years	171	223	394	16	16	32	9.4	7.2	8.1
55 to 59 years	150	163	313	12	9	21	8.0	5.5	6.7
60 to 64 years	79	88	167	11	6	17	13.9	6.8	10.2
65 to 69 years	78	89	167	8	5	13	10.3	5.6	7.8
70 to 74 years	43	26	69	7	1	8	16.3	3.8	11.6
75 years and over	16	8	24	0	1	1	...	12.5	4.2
Children unknown	3	1	4	0	0	0	...	...	...
Adults unknown	5	5	10	0	1	1	...	20.0	10.0
Total Negro	3,901	5,041	8,942	150	181	331	3.8	3.6	3.7

WHITE RACE

Owing to limitations of space and paucity of material, the analytic tabulation for the 340 white persons is not submitted. One fact needs to be mentioned concerning the white persons in the fifteen years and over period: a total rate, "reinfection type," for both sexes of 6.8 per cent, 9.5 per cent for the males, 4.5 per cent for the females. The figure, particularly for the males, is high. Further investigation will doubtless reveal that many of these cases have been contacts to open tuberculosis and such an investigation also will show that the families live under extremely poor environmental conditions.

NEGRO RACE BY AGE AND SEX

Table 2 gives the data on the 331 Negroes diagnosed as tuberculous and furnishes analysis on the lines of age and sex. The original work sheet, too detailed for consideration here, carried the analysis through the 648 cases listed as roentgenologic suspects and the 7,963 cases listed as roentgenologically negative. Although altogether 8,942 Negroes were examined and data charted in a routine manner for each case, owing to reasons of space limitations only the 331 diagnosed cases are considered here.

The high percentage of roentgenologically demonstrable tuberculosis, as shown in this table, for the age period 50 to 74 is significant. Presumably many or most of these cases were of the chronic, fibroid type and represent "fountains of infection." A tabulation dealing with the type of lesion as revealed by the x-rays

TABLE 3.—*Stage of Disease Against Age and Race*

	Reinfection Type	Minimal		Moderately Advanced		Far Advanced	
		No.	%	No.	%	No.	%
Negro							
14 years and under	24	12	50.0	12	50.0	0	....
15 to 19 years	37	21	56.8	15	40.5	1	2.7
20 to 24 years	32	14	43.7	12	37.5	6	18.8
25 to 29 years	32	16	50.0	13	40.6	3	9.4
30 to 34 years	30	15	50.0	8	26.7	7	23.3
35 to 39 years	27	10	37.1	12	44.4	5	18.5
40 to 44 years	32	14	43.7	15	46.9	3	9.4
45 to 49 years	24	11	45.8	12	50.0	1	4.2
50 to 54 years	32	15	46.9	14	43.7	3	9.4
55 to 59 years	21	11	52.4	9	42.8	1	4.8
60 to 64 years	17	7	41.2	6	35.3	4	23.5
65 to 69 years	13	8	61.5	3	23.1	2	15.4
70 to 74 years	8	3	37.5	3	37.5	2	25.0
75 years and over	1	1	100.0	0	....	0	....
Unknown adult	1	1	100.0	0	....	0	....
Total—Negro	331	159	48.0	134	40.5	38	11.5
White							
14 years and under	4	2	50.0	2	50.0	0	....
15 years and over	14	6	42.8	4	28.6	4	28.6
Total—White	18	8	44.5	6	33.3	4	22.2
Mexican							
14 years and under	0	0	....	0	....	0	....
15 years and over	2	0	....	1	50.0	1	50.0
Total—Mexican	2	0	....	1	50.0	1	50.0
Other races—none							
Totals	351	167	47.6	141	40.2	43	12.2

confirms this supposition. The tabulation is not given here but the summary shows a marked predominance of fibroid type lesions.

Referring again to table 2, crossing age against sex, taking the adolescents and early adult years, 15 to 29, the increased tuberculosis incidence in the Negro females corresponds roughly with the increased mortality for the period as revealed by the general tuberculosis death rate. Grouping the three periods shown in the table, the incidence for the males is 3.9 per cent against 4.9 per cent for the females. These figures represent an excess incidence for the females of 26 per cent, a ratio which holds for the mortality rate as revealed by the 1939 mortality tables for Chicago. The incidence rate for the children under 14 is also interesting, 0.6 per cent for the males, 1.0 per cent for the females, an average rate for both sexes of 0.8 per cent. This rate is significant. If continued at or about the level quoted, it will exercise an influence in outlining the future scope and purposes of the work.

In laying out the survey, the question arose as to whether children should be accepted for x-ray examination. Was x-ray examination of the children worth while? In a recent school survey comprising over 187,000 Chicago school children, the rate of case incidence under 14 years ran 0.72 per cent for the tuberculin positive children roentgenographed, 0.06 per cent for the total children tested. The rate for the Negro children was 1.01 per cent for the tuberculin positive children roentgenographed, 0.15 per cent for the total children tested. On the basis of these figures we necessarily had to consider the economic advisability of roentgenographing the children. We decided, however, to follow the original idea and roentgenograph the entire family. Though the futility of child x-ray examination in general groups must be conceded, the results in this area of excessive mortality seem to justify the procedure. An incidence of close to 1 per cent is well worth the effort and expenditure and discloses sidelights of interest from two totally different angles. Such a rate in children, objectively shown by the miniatures, reveals both the density of evolutive infection in areas of high mortality and the superiority of total x-ray examination over the old screen method.

STAGE OF DISEASE AGAINST RACE AND SEX

That serious pulmonary disease in appreciable amount is found in children of the substandard neighborhoods is demonstrated in table 3. In analyzing the twenty-four cases found, 14 years and under, it will be seen that twelve, or 50 per cent of the cases, were moderately advanced.

Studying the table further, it is seen that stage of disease shows a more or less consistent distribution for all age periods. Of much more importance are the figures relative to minimal tuberculosis. In view of the fact that, of the 863 Negroes diagnosed tuberculous in our clinics during 1939, 12 per cent were minimal and 88 per cent advanced, the ratio of minimal cases found in the survey, 48 per cent, must be considered as extremely gratifying. Many of these early cases showed excellent indications for pneumothorax and were referred to the collapse therapy clinic. The financial saving to the community represented by the discovery and prompt treatment of such early cases is obvious.

TYPE OF LESION

Considerable difference of opinion exists as to the possibility of accurately typing lesions from the x-ray plates. The tabulation covering this point is too lengthy for inclusion. The totals, arranged according to the classification decided on by the interpretation committee, run as follows and are submitted for what they are

TABLE 4.—*Incidence of Primary Tuberculosis as Revealed by the Miniatures*

	Cases Diagnosed Reinfection Type		All Cases Examined	
	No.	%	No.	%
Total cases	351	100.0	9,348	100.0
Complete primary	88	25.1	827	8.8
Incomplete:				
Hilar	36	10.3	455	4.9
Parenchymal	6	1.7	102	1.1
Total primary	130	37.0	1,384	14.8
Suspect primary	36	10.3	734	7.9
Primary not visible	185	52.7	7,230	77.3

worth: Of the 351 cases diagnosed, 45 per cent were classed as infiltrative, 14.8 per cent as exudative, 11.9 per cent as ulcerative, 0.9 per cent as proliferative, 3.5 per cent as cavernous, 33.6 per cent as fibroid and 10.0 per cent unclassified. Some of the patients, of course, had more than one type of lesion. Needless to say, any such classification is merely tentative and empiric, and sound decision as to type of lesion will have to wait on clinical observation as the patients go through the clinics.

PRIMARY TUBERCULOSIS

The committee again found itself on debatable ground in attempting to outline a classification for primary tuberculosis. The classification finally decided on is given in table 4, and the results are shown both for all films read and for films diagnosed "reinfection type." The table is shown for what it is worth and without the exhaustive analysis which is carried on the work sheets. Details on this and many other points will be furnished in a bulletin to be published later.

In studying the tabulation it is seen that 37.0 per cent of cases diagnosed reinfection type showed visible primary, as against 14.8 per cent for all films read. The significance of this finding is a matter of speculative interest and further research along this line is indicated.

NONTUBERCULOUS PULMONARY CONDITIONS

Of the Negroes examined, 6.4 per cent showed cardiac conditions and 1.9 per cent showed nontuberculous respiratory conditions. The figures for the white persons were 4.7 per cent cardiac and 2.6 per cent nontuberculous respiratory.

THE FOLLOW-UP

Owing to the fact that the work is continuous, the follow-up of the "suspects" is necessarily incomplete. Of the 680 persons diagnosed as having suspect reinfection, 287 have already been reexamined with the 14 by 17 film and more are coming in each day. Of the 287 cases already examined forty-five, or 15.7 per cent, have been diagnosed as pulmonary tuberculosis, 108, or 37.6 per cent, have been diagnosed as negative, and 134, or 46.7 per cent, have continued as suspects. From present indications, follow-up of the suspects represents a productive field and this phase of the program will be further intensified as the survey continues.

SUMMARY AND CONCLUSIONS

In the two months survey, 9,348 persons were roentgenographed and classified, of whom 351 showed roentgenologic evidence of tuberculosis on the original miniatures. Of the 351 cases discovered 167, or 47.6 per cent, were minimal, 141, or 40.2 per cent, moderately advanced and forty-three, or 12.2 per cent, far advanced.

Contrary to the usual concepts and to the trends of the mortality tables, the 340 white persons roentgenographed showed a higher rate of incidence than the 8,942 Negroes.

Total survey, including all members of the family, was justified by the unusually high rate that was found in children.

Total survey through the medium of the minature film and the mobile x-ray unit is at last an economic possibility and, in view of this new development, case-finding procedures will have to be revised.

The miniature film represents a new and efficient public health instrument destined probably to general acceptance by all communities with a serious tuberculosis problem.

Contrary to the opinion which seems to prevail for the moment in this country, I am convinced that future developments will lie in the direction of a still smaller and a still cheaper film, possibly the 35 mm. film as used by De Abreu of Rio de Janeiro. The technical difficulties involved are not insurmountable and the reduction in cost, reaching as low as a cent per film, constitutes a perennial inducement to further research.

EXPERIENCES WITH SURGICAL TREATMENT IN TEN CASES OF PATENT DUCTUS ARTERIOSUS

ROBERT E. GROSS, M.D.

BOSTON

The ductus arteriosus is a vessel which is essential for the fetal circulation but which ceases to be necessary after birth when expansion of the lungs allows more blood to flow through the enlarged pulmonary vascular bed. Having fulfilled its function in prenatal life the ductus normally becomes closed off following delivery of the child. Christie [1] found that 95 per cent of routine postmortem subjects at 12 weeks of age had a closed ductus and that 98.8 per cent of them at 1 year had this vessel obliterated. If the ductus arteriosus remains open during childhood or later life, the passage of blood through it (from the aorta to the pulmonary artery) forms an arterial leak which may assume considerable importance. If the ductus is small, the patient can indulge in reasonable activity and may have a normal life expectancy. If, however, the ductus is relatively large, physical work may be greatly limited and indeed death may follow by one of several mechanisms.

It is difficult to state how frequently the patent ductus arteriosus gives rise to significant pathologic change. A case in which death results from this abnormality is apt to be reported in the literature, whereas cases of the fistula without its major complications usually have little medical recognition as far as journalistic record is concerned. Although internists and cardiologists are cognizant of the fact that occasional patent ductus patients are 50 or 60 years old and in relatively good health, a collective survey of the medical literature would give a somewhat gloomy outlook for the individual who is beginning life with this abnormality. Abbott [2] has studied ninety-two fatal cases of patent ductus arteriosus in which there were no other cardiovascular abnormalities. In this group 43 per cent died of sudden or slow cardiac failure and 30 per cent died of subacute bacterial endocarditis or endarteritis of the pulmonary artery. The average age at death was 24 years. Bullock, Jones and Dolley [3] placed the incidence of bacterial infection at an even higher level. Little attention has been given to the fact that children with a large shunt between the aorta and the pulmonary artery may have a deficient peripheral flow of blood and consequently a retarded physical development. There are now sufficient physiologic observations in this regard [4] to show that delayed growth may be produced by persistence of the ductus.

To present accurate figures on the incidence of these various complications is impossible at the present time, because no one clinician or clinic has had sufficient experience to compute the prognosis. However, it is evident that subacute bacterial endarteritis, retarded

This study was supported by a grant from the Godfrey M. Hyams Trust.

From the surgical and medical clinics of the Children's Hospital and the Peter Bent Brigham Hospital.

Read before the Section on Radiology at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

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physical growth and heart failure are frequent enough to warrant surgical attempts at closure of the ductus in selected cases with the hope of diminishing the incidence of these sequelae. In February 1939 Gross and Hubbard [5] published a report of the first successful ligation (August 1938) of a patent ductus arteriosus. In March 1939 Gross [6] described an operative approach for this procedure and listed four cases in which this had been performed without mortality. In September 1939 these cases were presented in greater detail.[7] This series has now been extended to ten surgically treated children and adults,[8] observations from which form the basis of the present communication.

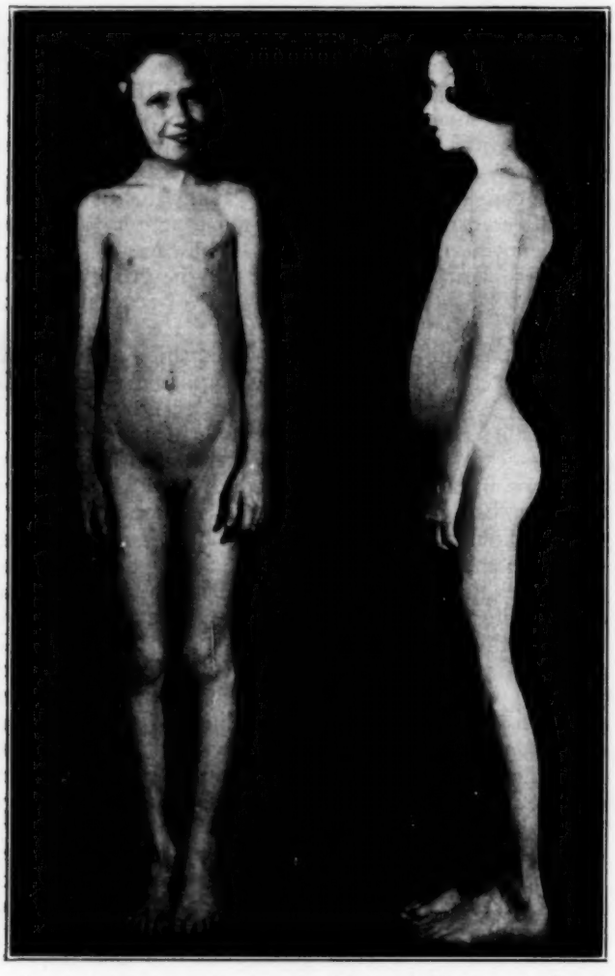

Fig. 1.—Appearance of 11½ year old girl (patient 5) showing the slender, underweight habitus which is common in children with a large patent ductus arteriosus. Patient's weight 57 pounds (26 Kg.); expected average normal, about 75 pounds (34 Kg.).

SYMPTOMS AND SIGNS

There has been a widespread tendency to classify individuals with a patent ductus arteriosus merely as having "congenital heart disease," but now that surgical therapeutic procedures are available for alleviation or cure of this lesion it is important to find the ways in which the abnormality can be recognized. Considerable study of the problem has convinced me and my medical confrères that the correct diagnosis can be made with a high degree of accuracy. The basis for this statement lies in the fact that a patent ductus was found in each of the cases in which exploration was done and in only one child was there an additional cardiovascular abnormality. It is therefore worth while listing the symptoms and signs which are now believed to be characteristic of the patent ductus.

The physical manifestations of this lesion may be entirely lacking in infancy and are apt to be confusing in the first two or three years of life but are almost always typical after the fourth year. Auscultation of the heart at birth or shortly thereafter may give negative results. This is exemplified by patient 6, who, though several competent observers heard no murmurs during the first year of life, was found to have a very loud murmur at 4 years of age. More commonly the patient has a murmur during the neonatal period which is difficult to place and time accurately because of the rapid heart rate, the fast respirations and the small size of the chest. As a child reaches the third or fourth year of life, a murmur develops which has several rather distinct features. It is continuous but is accentuated during systole. In whole or in part it is widely transmitted over the precordium, to the axillae and to the back, but it has a maximum loudness in the second or third interspace to the left of the sternum. In contrast to the "blowing" or "harsh" murmur of pulmonic stenosis or coarctation of the aorta, it has an unmistakable rumbling quality which is well described by the term "machinery murmur." The second pulmonic sound is almost always increased in intensity (if it is not overshadowed by the intense murmur), in contrast to the diminished or absent second sound in stenosis of the pulmonic valve. Cases are described in the literature as presenting only a systolic murmur (the ductus presumably being small) but in all of our cases the murmur was a continuous one.

A very coarse, precordial thrill, systolic in time or continuous with systolic accentuation, and most prominent over the pulmonic region, was a routine observation. Some did not develop this until the third or fourth year of life, and indeed cases have been observed in which the ductus is small and a thrill absent. The thrill may be quite intense and the patient or another member of the family is often conscious of a "buzz" within the chest.

The heart is usually slightly enlarged. It has a beat of accentuated vigor and a rate which is possibly somewhat increased. Following exercise the heart rate and the intensity of beat are above the expected normal response.

The blood pressure shows no significant change in its systolic level, but there is a low diastolic figure if the ductus is large. Thus the leak from the aorta may be sufficient to produce a significant fall of peripheral pressure when the aortic valve is closed (during diastole). If this loss is great enough, a water hammer pulse or a visible capillary pulsation can be detected on examination of the peripheral vascular system.

The physical development of the individual may be retarded, but this is not universally true. About half of our patients were underweight and quite slender, as depicted in figure 1. When patency of the ductus is the sole lesion, cyanosis is never observed unless the heart is failing and death is impending.

5. Gross, R. E., and Hubbard, J. P.: Surgical Ligation of a Patent Ductus Arteriosus: Report of First Successful Case, J. A. M. A. **112:** 729 (Feb. 25) 1939.

6. Gross, R. E.: A Surgical Approach for Ligation of a Patent Ductus Arteriosus, New England J. Med. **220:** 510 (March) 1939.

7. Gross, R. E.: Surgical Management of the Patent Ductus Arteriosus with Summary of Four Surgically Treated Cases, Ann. Surg. **110:** 321 (Sept.) 1939.

8. These cases were extensively studied and referred for treatment by Dr. J. P. Hubbard, cases 1 and 3; Dr. J. P. Hubbard and Dr. L. K. Diamond, case 6; Dr. W. R. P. Emerson and Dr. Hyman Green, cases 2 and 5; Dr. C. S. Burwell and Dr. E. C. Eppinger, case 4; Dr. S. A. Levine and Dr. Fresenius Van Nuys, case 7; Dr. J. E. Carroll of Hartford, Conn., case 8; Dr. P. D. White and Dr. H. B. Sprague, case 9, and Dr. K. D. Blackfan, case 10.

The history may reveal varying degrees of cardiac embarrassment. If the ductus is small, no impairment of physical activity will be found; if the fistula is large, a moderate but definite limitation in exercise is the rule; if the ductus is widely patent, frank failure may supervene. In one of our patients (17 years old) there had been recurring bouts of palpitation, dyspnea and peripheral edema for many years, while a woman of 26 had marked orthopnea for three years. In rare cases there may be sudden collapse or death, much the same as that encountered with aortic valve insufficiency.

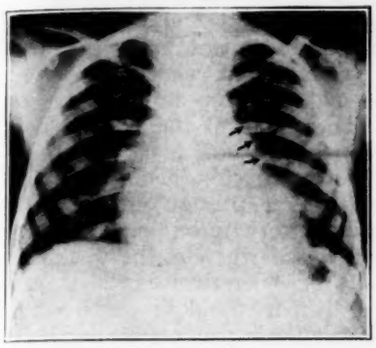

Fig. 2.—Seven foot roentgenogram (patient 8) showing three appearances usually associated with patent ductus arteriosus: (1) increased cross diameter of heart (transverse diameter of heart 10 cm., internal diameter of chest 17.6 cm.); (2) increased prominence of pulmonary artery (indicated by arrows) (3) vascular congestion in lung fields. The heart was unusually active, as shown by fluoroscopic and kymographic studies.

ELECTROCARDIOGRAPHIC OBSERVATIONS

When the ductus arteriosus remains open the left ventricle must pump a larger volume of blood per minute and the right ventricle must pump against a raised pressure in the pulmonic arteries. An additional load therefore falls on both sides of the heart, and it is not surprising to find that the electrocardiogram usually shows no axis deviation. In only one of our ten cases was there any axis deviation, a slight left preponderance being present in case 8; the other nine gave normal tracings. Well authenticated cases have been described in which there was a definite left axis or right axis deviation, but the finding of an abnormal electrocardiogram should at once arouse suspicions of some other cardiac lesion. This is particularly true of right axis deviation, which is suggestive of pulmonary valve stenosis.

ROENTGENOLOGIC OBSERVATIONS

Because the roentgenologic changes in the heart, great vessels, and lungs are being presented by Dr. Eppinger [9] I will not describe them here. Suffice it to say that the finding (fig. 2) of cardiac enlargement, prominence of the pulmonary artery, increased pulsation of the heart and great vessels and pulmonary congestion is not enough in itself to warrant making a diagnosis of a patent ductus arteriosus. However, it is valuable confirmatory evidence in establishing this diagnosis when evaluated with the clinical history, physical observations and electrocardiographic studies.

INDICATIONS FOR OPERATION

When it is reasonably certain that a given person has an uncomplicated patent ductus arteriosus, the question arises whether or not surgical obliteration of this vessel should be performed. The dangers of the untreated abnormality must be balanced against the possible hazards of operation. If the patient's chances for developing important complications appear to be relatively high, the risks of surgery can be taken with impunity. Hubbard, Emerson and Green [10] have pointed out that each case should be evaluated, for by no means should all these individuals be subjected to operative treatment. The fact that some people live a relatively long and active life (particularly if the ductus is small) should make the clinician cautious in advising surgical treatment. It is possible that views may change as experience is broadened, but the following points sum up our present attitude with regard to criteria for selection of cases for surgery:

Shortcircuiting of blood through the fistula can so diminish the peripheral flow that the physical development is significantly retarded. When this occurs there is clearly a justification for closure of the ductus. This indication for operation is largely concerned with children from 5 or 6 years up to adolescent ages.

The deviation of blood by way of the shunt may be counter-balanced (in some cases) by an appreciable increase in the left ventricular output per minute. In this way the peripheral flow of blood can be maintained at or near normal and the individual will develop properly; but in attaining these ends the heart is so overworked that it eventually fails. Physiologic studies on some of our older patients [4] clearly show that the left ventricular output was two or three times the expected normal, and hence it is easy to understand why cardiac failure should occur. While decompensation appeared in case 4 at the age of 6 years, it is rarely seen before puberty. If it is ever to be a serious menace, it almost invariably manifests itself before the age of 30. In other words, if a man or woman has arrived at the age of 30 or 35 without history or evidence of decompensation, the chances are good that it will not be found at a subsequent period. The presence of (or history of) cardiac failure in any form is a definite indication for operation. This should be extended to include any cardiac embarrassment, even though frank failure does not exist. Under this broad category would be appreciable enlargement of the heart, undue increase in its

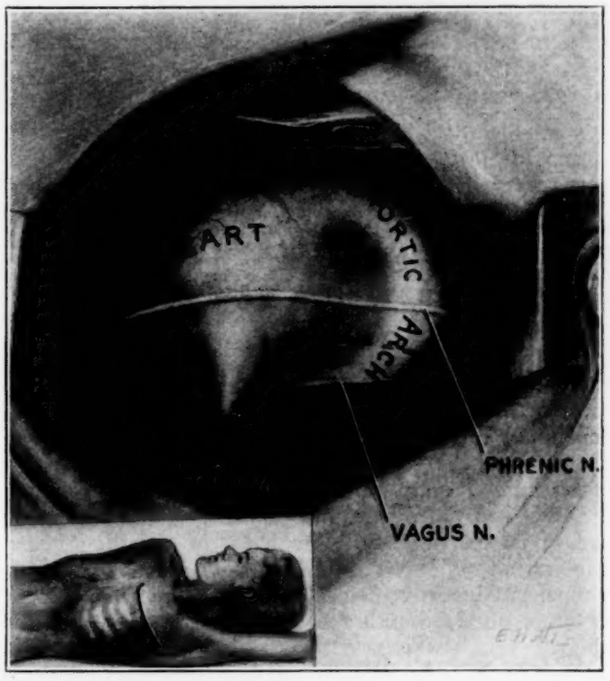

Fig. 3.—Operative approach to the ductus arteriosus. Inset shows position of patient and of the cutaneous incision. The chest is entered through the second interspace and the second and third costal cartilages have been cut. The pleural covering of the mediastinum will be opened along the dotted line.

9. Eppinger, E. C., and Burwell, C. S.: The Mechanical Effects of Patent Ductus Arteriosus on the Heart and Their Relation to the X-Ray Signs, to be published.

10. Hubbard, J. P.; Emerson, P. V., and Green, Hyman: Indications for Surgical Ligation of a Patent Ductus Arteriosus, New England J. Med. **221**: 481 (Sept. 28) 1939.

rate and beat after mild exercise and overactive cardiac impulse by physical or fluoroscopic examination.

In the presence of a patent ductus arteriosus, the lungs receive blood from the venous circulation by way of the right ventricle, and in addition blood pours

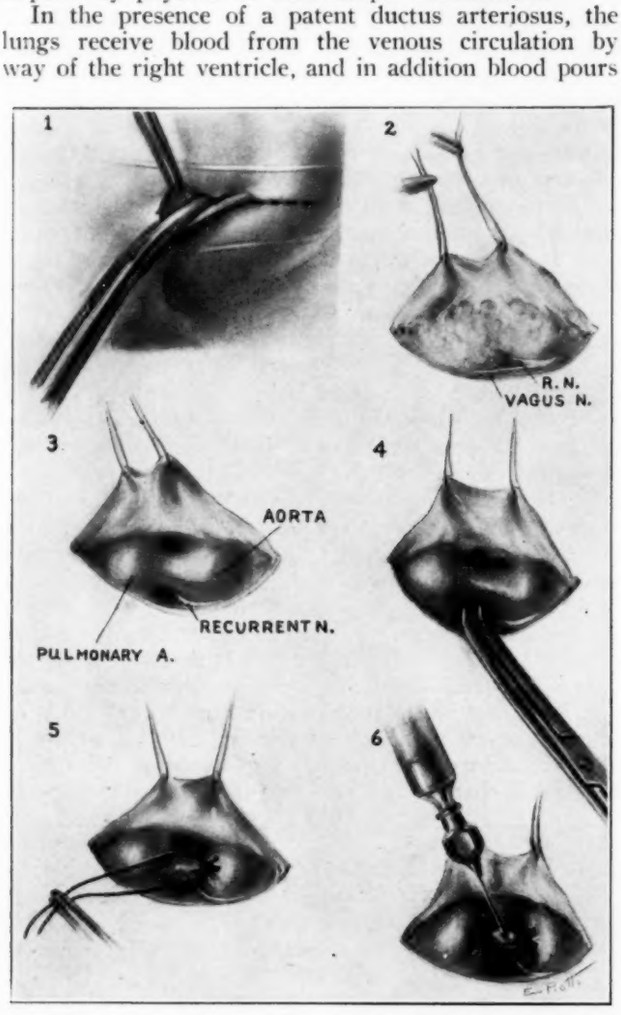

Fig. 4.—Details of operative exposure of the ductus: 1. Base of heart and great vessels; parietal pleura being opened along the dotted line. 2. Presenting fat and areolar tissue dissected to isolate the recurrent laryngeal nerve. 3. Ductus completely freed of overlying fat. 4. Posterior wall of ductus freed by blunt dissection. 5. Double ligatures in place, and one of them has been tied. 6. Both ligatures tied; sclerosing fluid is being injected between them.

in at high pressure from the aorta. It is therefore evident that the amount of blood in the pulmonary vascular bed is greater than normal, the increment depending directly on the size of the ductus and the pressure within the aortic arch. Because of this increased volume of pulmonary blood, the vital capacity is reduced and orthopnea may appear. Thus, orthopnea per se is not necessarily evidence of a failing heart, but indeed it might be brought about by an overcompensated left ventricle which is forcing increased amounts of blood into the aorta and thereby into the lungs. The striking symptomatic improvement in a woman of 26 (case 9) who had had orthopnea for three years has certainly made this symptom an indication for operation.

Regarding the dangers of a future Streptococcus viridans infection as a justification for operation, I believe there is considerable room for debate. Theoretically, if the fistula could be closed off and the swirling of blood in the pulmonary artery be thereby abolished, the subsequent incidence of fatal bacterial infection would probably be reduced. However, the operation which I, and subsequently others, have performed is only a ligation of the ductus, and while complete obliteration of the vessel can be accomplished in some cases, there are others in which a tiny pinhole opening persists no matter how tightly the ligatures are applied. These facts are evident by the complete absence of postoperative murmurs in some cases and persistence of minimal ones in others. It is therefore evident that ligation of a ductus can greatly diminish the mechanical burdens of a heart and can improve the peripheral circulation of the patient, but at the same time a small opening can maintain some swirling of pulmonary artery blood and still keep alive the danger of subacute bacterial endocarditis. I therefore believe that—with the operation which is now practiced—there is little justification for submitting individuals to surgery solely for the theoretical prevention of future endocardial or pulmonary artery infection. If, however, a method can be devised whereby the ductus is completely divided and the operative mortality can be kept at a low figure, then it would be worth while operating on practically all these patients in the hope of diminishing subsequent endocarditis or endarteritis. Toward the goal of developing a method for safely dividing the ductus I have spent considerable time in the laboratory and have found a way which promises to furnish this additional step without undue risk. The opportunity has not yet presented itself to attempt this in a human case.

A final discussion of indications for operation is concerned with the individual who already has a superimposed Streptococcus viridans infection which will presumably terminate fatally. Theoretically, closure of the ductus may diminish eddying of blood in the pulmonary artery, limit the formation of bacterial vegeta-

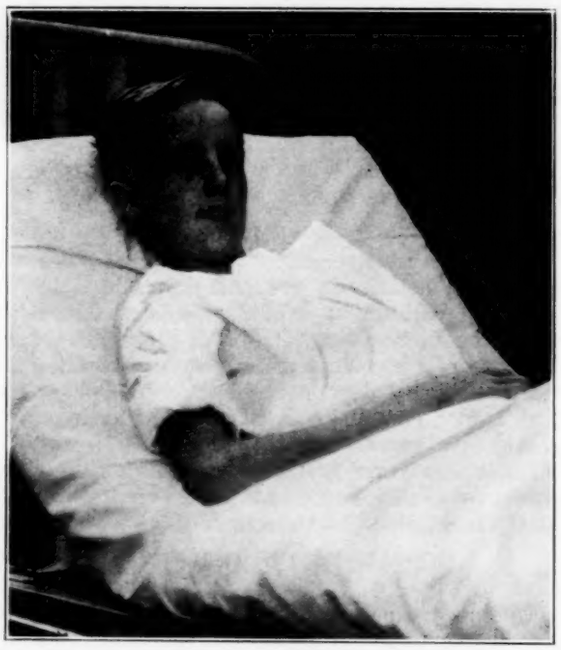

Fig. 5.—Patient 2 on first postoperative day. These patients have little discomfort if the operative procedure is carefully done.

tions and permit existing ones to be better treated by chemotherapy. This optimistic view must be discounted by the fact that a ductus or pulmonary artery which is the seat of bacterial vegetations is apt to be eroded and friable and hence may rupture if disturbed by the surgeon's manipulations. Touroff [11] has recently oper-

11. Touroff, A. S. W.: Personal communication to the author.

ated on four such patients. Two died on the table from fatal hemorrhage, one still has positive blood cultures fourteen weeks after operation and a fourth has been apparently cured of her bacteremia sixteen weeks after operation. It can be argued that any risk is defensible

TABLE 1.—*Summary of Ten Cases of Patent Ductus Arteriosus in Which Surgical Ligation Was Done*

			Indications for Operation*				
Patient	Age	Sex	Retarded Development	Cardiac Embarrassment	Cardiac Failure	Orthopnea	Postoperative Result
1	7	♀	++	+	..	..	Improved
2	11	♂	++	++	..	..	Improved
3	7	♀	++	++	..	..	Improved
4	17	♀	..	..	+++	..	Improved
5	11	♀	++	+	..	..	Improved
6	6	♀	+	+	..	..	Slightly improved†
7	15	♀	+++	++	..	..	Died‡
8	5	♀	+	..	..	..	Improved
9	26	♀	..	+++	..	+++	Improved
10	10	♀	..	++	..	..	Improved

* An attempt has been made to show the severity of the preoperative conditions by +, ++ and +++.

† Besides the patent ductus arteriosus, this girl has some other cardiac abnormality and has had only slight improvement from operation.

‡ Patient died two weeks after operation from Staphylococcus aureus infection.

which offers the least hope of curing these desperate cases. I have not yet subscribed to this rationale, because some individuals with subacute bacterial endocarditis live many months in fairly good general health while a surgical patient with a ruptured ductus will probably be dead in a few minutes. Hence I have not chosen to treat such persons surgically; but further experience may show that the operation has merit if used when the infection is of short standing and the vessel walls are not yet ulcerated and thinned out.

OPERATIVE TECHNIC

It is not within the scope of this presentation to describe extensively the operative technic, which has been given in detail in previous communications.[12] Briefly, the ductus can be adequately and safely brought into view by an approach through the left anterolateral chest wall (fig. 3), traversing the left pleural cavity, temporarily collapsing the left lung, opening the parietal

TABLE 2.—*Changes of Weight in Thin Children Following Ligation of the Patent Ductus Arteriosus*

		Record of Weight			
		Before Operation		After Operation	
Case	Sex	Age, Years	Weight, Pounds	Interval, Months	Weight Gain, Pounds
1	♀	7	48	15	12
2	♂	11	62	18	22
3	♀	7	42	12	8
5	♀	11	57	4	10

pleura of the mediastinum (fig. 4) and then dissecting down between the great vessels. The cutaneous incision can be made above or below the nipple, and in the adult woman it could be made below the entire breast. Entry through the second space gives a good exposure, provided the intercostal muscles are divided well around into the axilla. Great care and patience must be exercised in freeing up and isolating the ductus for fear of injuring it or the regional structures. The ductus has always been so short that I have not dared to divide it in any instance. Heavy braided waxed silk ligatures were used in all of these cases and this was supplemented in the more recent ones by injecting a sclerosing fluid between double ligatures. It is difficult to describe just how tightly the ligatures must be applied, for this can be determined only by experience with some of these operations. If the ties are too loose, a small fistula may persist; if they are too tight there is danger of their cutting through the vessel. Following ligation of the ductus, the left lung is reexpanded with positive pressure by the anesthetist, and the chest is closed.

The anesthetic in eight cases was cyclopropane, but in the other two ether in a closed system served quite well. In no case has an intratracheal tube been used, since a tightly fitting face mask adequately permitted positive pressure expansion of the lung whenever this was necessary.

If the operation is carefully done, it is tolerated very well and there is little postoperative reaction (fig. 5). Some of these patients have been out of bed on the first or second day, and hospitalization of more than seven to ten days after operation is seldom necessary.

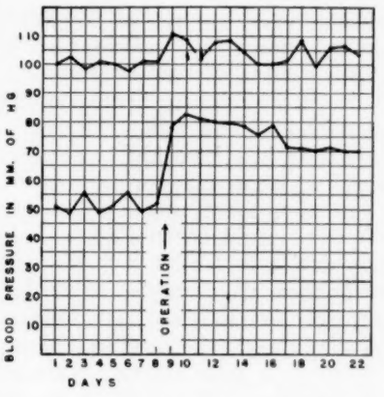

Fig. 6.—Typical blood pressure before and after ligation of a patent ductus arteriosus (case 5). If the ductus is large, the diastolic pressure is low. On ligation of the ductus, the diastolic pressure immediately rises to normal.

RESULTS OF OPERATION

In the present series of ten[13] surgically treated patients (table 1) one died two weeks after operation from a Staphylococcus aureus infection and one proved to have a complicated cardiac abnormality and has derived only slight benefit from operation. The other eight individuals have all shown a progressive and gratifying improvement. The ways in which they have been altered may be analyzed as follows:

Patients 1, 2, 3, 5 and 7 each had important retardation in physical growth prior to operation. The first four of these have now been followed long enough to gain a clear idea of the results of the surgical undertaking. It has been surprising to observe the physical alterations which are typified by the weight gains shown in table 2. This postoperative change was most marked in case 2, in which there was a gain of 22 pounds (10 Kg.) in eighteen months after ligation of the ductus. These augmentations in weight have been particularly significant since they occurred in children who previously were thin and poorly nourished, in spite of medical efforts to combat this condition. In short, closure of the fistula allows more blood to flow to the periphery, so that the physical development is improved.

12. Gross (footnotes 6 and 7).

13. Since completion of this manuscript two more patients, aged 22 months and 7 years, have been successfully operated on. There has been complete disappearance of the murmurs in both of them.

A rise in diastolic blood pressure was found after operation in each case. In case 6 the ductus was relatively small and after its ligation the diastolic pressure rose only from 10 to 15 mm. of mercury. In all other cases (including case 7) there was an immediate rise of the diastolic level from its low preoperative level of 30 to 50 mm. of mercury to a normal value of 70 to 75 (fig. 6). In some cases there was a tendency for the diastolic pressure to be slightly higher than normal for from five to seven days after operation, following which it assumed a normal value.

The physical activity of patient 6 has been improved to only a slight degree, but in the other eight surviving individuals there has been a definite improvement in capacity for exercise. This has not been quantitatively tested on a treadmill or other mechanical device, but patients have volunteered the information that they "could run farther," that the "heart did not speed up the way it used to," that there was "no more palpitation" after moderate exercise, that "the heart does not pound the way it did formerly," and so on. An improved peripheral circulation was spontaneously noticed by several patients, who found that their feet and hands were warmer than they had been previously during cold weather, and this observation was further substantiated by physical examination of the extremities.

One individual (patient 4) who had had attacks of frank cardiac decompensation as often as two or three times a year before operation has now gone eighteen months since operation without evidence of failure at any time, in spite of the fact that she has been indulging much more in outdoor sports.

Finally, there was a 26 year old woman (patient 9) who would become dyspneic from light housekeeping duties and who had been primarily bothered by orthopnea, which necessitated sleeping in a semisitting position for the last three years. Under observation in the hospital she could not be encouraged to lie down flatly on a table or bed for more than from ten to fifteen minutes because she would become choked up, uncomfortable and short of breath. Since operative ligation of her patent ductus, she carries on normal household work and has been able to sleep all night in a flat position without any difficulty.

SUMMARY AND CONCLUSION

The accuracy with which it is possible to make the diagnosis may be judged by the fact that exploration was done in ten cases and a patent ductus found in each. In only one case was there another cardiovascular abnormality. Operation should be advised only for carefully selected cases. With the procedure which is now employed (ligation), it is not felt that complete obliteration of the vessel can be accomplished in all cases; hence it is not believed that all individuals with a patent ductus arteriosus should be operated on in the hope of preventing subacute bacterial endocarditis. If, however, a procedure can be developed by which the ductus can be completely but safely severed, it will be justifiable to employ the operation more extensively to diminish the incidence of Streptococcus viridans infection. A review of our material shows that ligation of the patent ductus arteriosus is productive of excellent postoperative results when used for patients who have retarded physical development or evidence of cardiac embarrassment.

300 Longwood Avenue.

THE MECHANICAL EFFECTS OF PATENT DUCTUS ARTERIOSUS ON THE HEART

AND THEIR RELATION TO THE X-RAY SIGNS

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AND
C. SIDNEY BURWELL, M.D.
BOSTON

The appearance of the heart shadow on the x-ray film or screen is determined partly by the structure of the heart and partly by what William Harvey called "the movements of the heart and blood." The dynamic events which accompany the pumping of blood influence the size and shape of the shadow, the excursion of its borders, the pulsation of the great vessels and even the volume of blood in the adjacent lungs. Much has been learned about the dynamics of the heart through the medium of the x-rays; it is possible that something may be learned about x-ray signs by a study of circulatory dynamics.

The brilliant operation described by Gross [1] provided the opportunity for making measurements of the circulation of patients with patent ductus arteriosus.

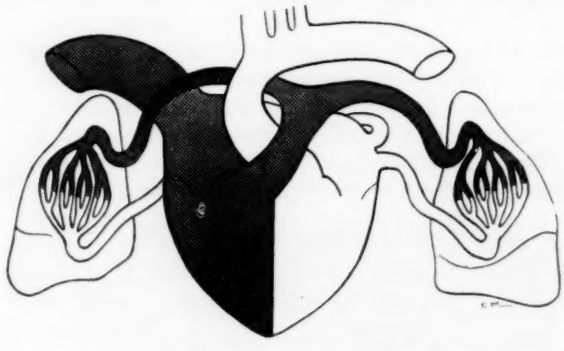

Fig. 1.—The flow of blood in a normal person.

Figure 1 illustrates the flow of blood in a normal heart. In a resting individual about 4 liters of blood per minute returns from the periphery and the same amount is pumped out by the right ventricle, passes through the lungs, enters the left side of the heart and is pumped out by the left ventricle. It is thus clear that the outputs of the right and left ventricles are essentially identical in the normal individual. However, a different situation is created by a patent ductus arteriosus, since the ductus arteriosus connects the aorta with the adjacent pulmonary artery (fig. 2).

Studies made on Gross's patients have led to the acquisition of important information with regard to the circulation in these patients, which may be summarized as follows:

1. A stream of blood flows from the aorta to the pulmonary artery through the ductus; this flow is going on during both systole and diastole. This blood, shunted from the aorta without having gone to irrigate the periphery, returns through the lungs to the left side of the heart which it just left. Thus, the shunted stream serves no useful purpose. It should be emphasized that this is not a situation in which venous blood enters the

From the Department of Medicine, Harvard Medical School, and the Medical Clinic of the Peter Bent Brigham Hospital.

Read before the Section on Radiology at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

1. Gross, R. E., and Hubbard, J. P.: Surgical Ligation of a Patent Ductus Arteriosus: Report of First Successful Case, J. A. M. A. **112:** 729 (Feb. 25) 1939.

arterial system but one in which arterial blood is entering the pulmonary system. Since blood in the arterial system is not diluted by venous blood, these patients are not cyanotic. Under the conditions of operation from 45 to 75 per cent of the blood pumped out by the left ventricle into the aorta passes back through this short circuit into the pulmonary artery (Eppinger, Burwell and Gross [2]).

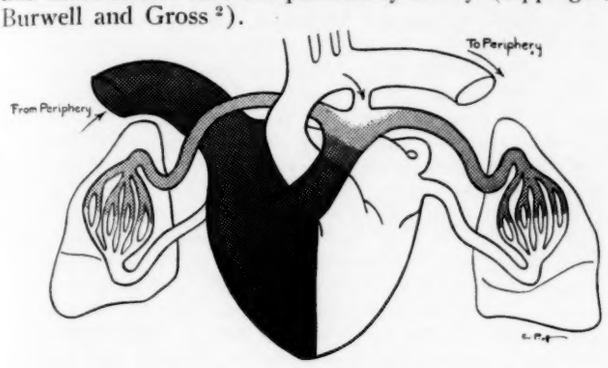

Fig. 2.—The flow of blood in a patient with patency of the ductus arteriosus.

2. That portion of the blood in the aorta which is not shunted goes to the periphery and returns to the right ventricle. Therefore, a situation is created in which the right ventricle has only one source of blood (i. e. the peripheral circulation) while the left ventricle has two sources of blood (i. e. the blood from the right ventricle and the blood returning through the short circuit). In the cases studied the left ventricle had to pump from two to four times the amount of blood put out during the same time by the right.

3. The leakage of blood from the high pressure aorta to the lower pressure pulmonary artery is accompanied by a fall in the peripheral diastolic pressure and a slight rise in the pulmonary artery pressure. To emphasize the magnitude of these changes we present in table 1 the actual measurements of the blood flow before and after operation.

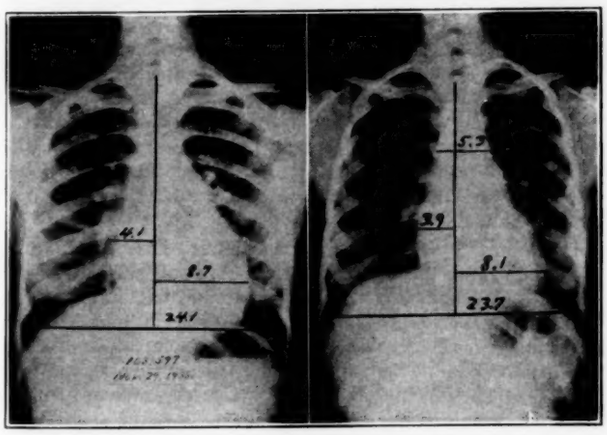

Fig. 3.—Anteroposterior appearance before and after ligation of the ductus.

These deviations from normal in the movement and distribution of blood suggest certain signs which should be sought in the x-ray examination by film, fluoroscopy and kymogram.

These include the following:

1. The greatly increased output of the left ventricle indicates the possibility of the enlargement of this chamber.

2. Since both the left ventricle and the pulmonary artery are transmitting with each beat an increased volume of blood, they may be expected to show an increased pulsation.

3. Since the pulmonary artery receives blood from two sources, and since it has been seen at operation to have overflowed, the silhouette of this artery may exhibit unusual prominence.

4. Because of the increased flow of blood into them, the pulmonary vessels may show the signs of engorgement.

5. The combination of increased inflow and engorgement may lead to increased pulsation of the pulmonary artery branches.

6. If a normal mitral valve is not wide enough to transmit this large amount of blood without an elevated left auricular pressure, there may be a visible dilatation of the left auricle. (It may be mentioned that one of our patients before operation showed a mid-diastolic apical murmur characteristic of mitral stenosis. Since ligation of the ductus this murmur has never been heard.)

These six signs were then sought in the films and in the recorded fluoroscopic examinations of the nine patients operated on by Gross. In this search we had

TABLE 1.—*Actual Measurements of Blood Flow Before and After Ligation of the Ductus*

Patient Number	Blood Flow Before Operation: Peripheral, Liters	Blood Flow Before Operation: Pulmonary, Liters	Volume of Shunt, Liters	Percentage of Shunt	Blood Flow After Operation, Peripheral and Pulmonary, Liters
2	5.9	25.4	19.5	77	5.1
3	...	19.1	....	..	6.2
5	4.8	8.7	3.9	45	3.3
6	6.0	14.1	8.1	57	6.3

TABLE 2.—*Occurrence of the Predicted X-Ray Signs in Patency of Ductus Arteriosus*

	Patient 1	2	3	4	5	6	7	8	9
Left ventricle enlargement	++	++	++	++	++	0	++	++	++
Increased pulsation of left ventricle and pulmonary artery	++	0	+++	+++	++	+	++	×	+
Prominent pulmonary artery	++	++	++	+	+	+	?	+	++
Pulmonary congestion	+++	++	++	++	++	+	+++	++	++
Dilated left auricle	++	+	+	+++	+	×	+	+	+
"Hilar dance"	++	0	0	0	+	0	0	0	+

the indispensable aid of Dr. M. C. Sosman and Dr. G. M. Wyatt.

The frequency with which these signs were found is shown in table 2. An attempt was made to estimate the degree of deviation from the normal, which is expressed as 1+, 2+ or 3+.

Left ventricle enlargement of a moderate degree was present in eight of the nine cases. Increased pulsation of the left ventricle and pulmonary artery was present in seven of eight and not recorded in one case. A prominent pulmonary artery was observed in eight out of nine and was questionable in one. Perhaps the absence of visible prominence in this one case was due to the great enlargement of the left auricle, which may have obscured the shadow of the pulmonary artery. An increased volume of blood in the pulmonary vessels (pulmonary congestion) was demonstrable in all cases. A dilatation of the left auricle, usually of mild degree and best seen in the right anterior oblique view, was observed in the eight cases in which appropriate plates were made. The so-called hilar dance of traditional value was present in only three of the nine cases.

2. Eppinger, E. C.; Burwell, C. S., and Gross, R. E.: The Effects of Patency of the Ductus Arteriosus on the Circulation, to be published.

Examples of some of these observations are shown in figures 3, 4 and 5, in which the x-ray phenomena before and after ligation of the ductus are demonstrated. Figure 3 is a reproduction of seven-foot plates of the heart before and after operation. They illustrate the enlargement of the left ventricle, the prominence of the

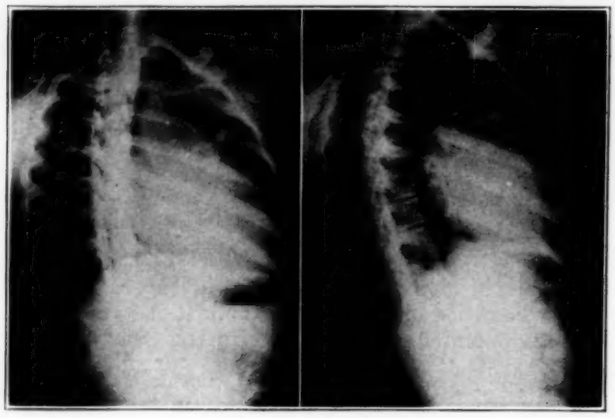

Fig. 4.—Right oblique appearance before and after ligation of the ductus.

pulmonary artery and pulmonary congestion, all of which are less marked after the operation. Figure 4 is a reproduction of films taken obliquely and illustrates particularly the change in the size of the left auricle which followed ligation of the ductus. The x-ray kymograms (fig. 5) illustrate in some degree the increased pulsation of the left ventricle, the pulmonary artery and the pulmonary artery branches, although these pulsations were more clearly observed on the fluoroscopic screen. There is an impressive contrast between the violently overactive left ventricle with the ductus open and the relatively calm left ventricle after ligation.

CONCLUSIONS

The analyses of these cases leads to the conclusion that the x-ray signs suggested by the observed changes in the circulation are usually present in patients with patent ductus arteriosus.

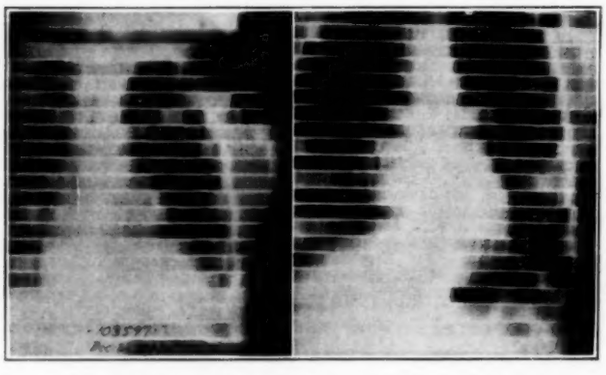

Fig. 5.—Kymogram before and after ligation of the ductus.

On the whole the signs are not sufficiently specific to supply final testimony concerning the diagnosis of patent ductus arteriosus. However, if the relation of these x-ray signs to the dynamics of the circulation is understood, appropriate x-ray studies may (1) suggest the diagnosis, (2) contribute important confirmatory evidence and (3) bear important witness as to the effectiveness of therapy.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. GROSS AND DRS. EPPINGER AND BURWELL

DR. CLAUDE S. BECK, Cleveland: Rarely in this day does a surgeon perform an operation that will be recorded in the pages of medical history. Nevertheless, this was accomplished by Dr. Gross when he successfully placed a ligature around a patent ductus arteriosus. This operation, done in August 1938, ended a forty year period of sporadic and casual interest and began an era which in two years has produced many successful cases. As far as can be determined from the literature, the original idea came from John Monro of Boston, who carried out dissections on infants and proposed the operation to the Philadelphia Academy of Surgery in 1907. There is no record of the operation having been attempted by Monro. In 1924 Holman and I carried out experiments in which we attempted with some measure of success to prevent the patent ductus from closing in newly born dogs. This was done by producing a stenosis of the pulmonary artery. We, as well as a number of other surgeons, were interested in applying the idea to patients, but there were no patients for operation. The operation had never been performed and the medical men who saw these patients did not have them operated on. For this reason I believe I should mention the name of John Hubbard, who referred the patient on whom the first successful operation was done. The first attempt to carry out the operation was by Strieder in 1937. Strieder's patient had bacterial endarteritis before operation, and at operation an anatomic condition was found which made the passage of a ligature impossible. Plication sutures were used and the communication was not completely closed. The bacterial infection persisted and the patient died several days after operation. These ten operations by Gross are a most amazing record of success. To these can be added other records of achievement—thirteen patients by Bullock, Jones and Dolley of Los Angeles, one by Bigger of Richmond, one by Gurd of Montreal and one or more by Holman of San Francisco. Last week at the meeting of the Thoracic Surgical Association in Cleveland, Touroff and Vesell reported operations on four patients with bacterial endarteritis and septicemia. These heroic operations in cases of infection deserve special comment, because one patient has been free from infection for nineteen weeks since operation, one has had improvement in the circulation but infection persists seventeen weeks after operation, and two died of hemorrhage at operation. It would appear, therefore, that the presence of infection in the blood stream is not always a contraindication to operation. Touroff believes that active vegetations in the left side of the heart or in the aorta preclude operative intervention. If the infection is recent in terms of days or weeks so that significant vegetations have not formed, it would appear that success is still possible. Perhaps one can look forward to the day when the defect in the aorta and the pulmonary artery can be closed by direct arterial suture.

DR. WILLIAM D. STROUD, Philadelphia: Ever since hearing the discussion of this operation at the St. Louis session last year, I have been skeptical concerning it. Congenital heart cases fall into three classes: The first includes those in which the maldevelopment was so great that a few days, a few weeks or a few months was all the patient could expect. The second group includes cases showing clubbing of the fingers and toes, marked cyanosis and breathlessness with poor physical development. Here all the physician can do is to encourage the family and attempt to arrange proper educational facilities, occupational therapy and vocational training until tuberculosis, pneumonia, subacute infective endocarditis or heart failure causes the end. The third group, and the one in which I had always considered patent ductus arteriosus, includes patients with signs of congenital maldevelopment of the heart but in whom it apparently has very little effect from the standpoint of development, length of life and circulatory efficiency. The cardiologist's job in these cases was to persuade the family and the patient he was not a hopeless cripple, which other physicians had persuaded him he was. Last Friday Dr. Shapiro read an interesting paper on this subject before the American Heart Association. He feels, as I

had felt until this morning, that bacterial endocarditis is relatively rare in these cases. I was much surprised to hear from Dr. Gross that it occurred in 40 per cent, and he may be right. I looked up ten patients whom I had seen in the past twenty years. So far none of them had died or shown evidence of congestive heart failure and none have developed bacterial endocarditis. I therefore feel we must be careful in considering this operation merely because of the possibility of bacterial endocarditis. A discussion as to whether or not an operation is indicated after bacterial endocarditis has developed is interesting because of recent reports of successful removal of arteriovenous aneurysm in which bacterial endocarditis has developed. I should like to ask whether there is any truth in the suggestion that this operation might be contraindicated as other congenital defects are so common with a patent ductus arteriosus and that the latter might be a compensatory mechanism, especially in the presence of congenital pulmonary stenosis with or without a patulous interventricular septum. From what the authors said, the blood is just shunted back and forth through the patent ductus arteriosus and therefore is of no value. If this is true I cannot see how a patent ductus arteriosus could be a compensatory mechanism. The improvement in bodily development following this operation is most interesting. Some of my patients are definitely underdeveloped in spite of the fact that they have no breathlessness or apparent circulatory insufficiency. Perhaps such maldevelopment is a worthy factor in considering this operation.

DR. HARRY VESELL, New York: Praise is due Dr. Gross for showing that this operation can be done with reasonable risk and success in uninfected cases. I want to confine my remarks to cases of patent ductus arteriosus in which bacterial infection is superimposed. Dr. Touroff and I had the good fortune of observing a woman aged 29 who had patent ductus arteriosus with a superimposed infection which we considered rather severe because of the presence of a large number of colonies in the blood cultures. Two were taken before operation; one in the flask showed a great number, and one that was plated out showed 400 colonies per cubic centimeter. The patient had a very septic temperature. After a week she was operated on. Several days after operation, two successive blood cultures were negative. Six or seven further blood cultures were taken and they were negative. She had a more or less uneventful course thereafter and is now, nineteen weeks after operation, back at work and feeling perfectly well. One point that I wish to emphasize is the question of valve infection in these cases when subacute infection is superimposed. Cases collected particularly by Dr. Blumer indicate that infection of the valves does occur, and as indicated by Dr. Blumer and also Dr. Abbott this valve infection is a more or less late phenomenon. In spite of the fact that many cases have been observed to go along for a period up to two years and then come to autopsy, a considerable percentage of them, even after that period of time of infection, up to two years, failed to show infection of the valve. Certainly infection of the aortic and mitral valve would be a great handicap to any expectation of success from the operation. In view of the fact that these valve infections occur late, I think it is incumbent on us, if we consider the operation at all, to have it done very early, just so soon as the diagnosis of infection on the patent ductus can be made.

DR. MAUDE E. S. ABBOTT, Montreal: I am very happy to have the opportunity of hearing Dr. Gross. He has revolutionized the outlook on the therapeutic aspects of congenital heart disease. Of course, the patent ductus does seem the most getatable anomaly for surgical intervention, but we have not ended there and it is a great event in this field. The fact that he has done nine cases successfully and in such a simple way, with recovery so quickly as in the first several of these cases, is really miraculous. I believe the most favorable time, as said by Dr. Gross and the others who have operated, to be in early childhood; that is, 7 or 8 to 10 or 12, because, as the last speaker pointed out, of the likelihood of the later development of infective valvular disease. We all know that the first onset one sees of bacterial endocarditis is around the pulmonary end of the ductus and these later valvular lesions come on after some little time, so the favorable time is before the onset of widespread subacute bacterial endocarditis. I had the opportunity in March of seeing one of Dr. Touroff's patients, a girl of 18 who had been successfully operated on, January 27. She had a large number of colonies in the blood stream and is now apparently quite free from infection with no fever, the blood culture is sterile and she is back at her office work apparently in perfect health. This is a great record of achievement. If the operation extends to cases of bacterial infection, a much more difficult and hazardous field, of course, it is a big thing, because this is the most serious complication that awaits these individuals.

DR. M. J. SHAPIRO, Minneapolis: I have been greatly stimulated by the work of Drs. Gross, Eppinger and Burwell. I have had nineteen patients with patent ductus arteriosus since 1922. The main reasons for doing this operation are, first, to hope to prevent subacute bacterial endarteritis and, second, to prevent congestive heart failure. I did not say in my paper that subacute bacterial endo-arteritis and congestive failure are rare, but I said that the statistical evidence in the literature is not clear as to how often these complications occur. The figure of 25 per cent or 40 per cent of subacute bacterial endocarditis in patent ductus arteriosus is based almost entirely on pathologic studies. I believe that most of these cases that were studied pathologically were unusual. I know from postmortem examinations that, when the ordinary postmortem examination is done, the ductus arteriosus is missed. I believe that patency of the ductus must be more common than is appreciated. There have been some very unsatisfactory results with this operation. Dr. Gross deserves the utmost praise for his achievement, yet there have been other excellent surgeons who have attempted this operation and have failed. Of my nineteen patients only one or two were maldeveloped. I have been impressed with the unusually good physical condition in this group. In regard to the question of subacute bacterial endarteritis, we know that one of Dr. Jones's patients died about forty-five days after the operation of subacute bacterial endarteritis which developed at the point of ligation. Interestingly enough there was recanalization of the duct. I believe some of the patients who have been operated on are not any different from the group of patients I have followed, some of them as long as seventeen years, and who showed no evidence of cardiac failure. Not one of my nineteen patients has developed subacute bacterial endarteritis, and only one patient died after surgery. I believe that surgical operation should remain for those patients who give evidence of enlargement of the heart. These patients should not be operated on when they are young unless one can prove by observation that the vessels in the lungs are getting larger, the heart is increasing in size and there is some evidence of congestive failure. In regard to operating on patients with subacute bacterial endarteritis, I should be in favor of operating on every one of them because at the present time we have nothing to lose.

DR. HAROLD E. B. PARDEE, New York: I have not had great personal experience with cases of congenital heart disease. I have felt as Dr. Stroud does that it has been a comparatively uninteresting subject from the point of view of treatment. I feel, however, that this surgical procedure marks a tremendous advance and warrants considerable discussion. It has great promise and with further development the present operative mortality will be greatly reduced. I do not believe that we know what the operative mortality is at present. I do know that of two reported series totaling thirty cases there have been two deaths, which is a mortality of about 7 per cent. We have heard at this meeting of a couple of other cases in which death occurred and which have not been reported, so that I believe that in the hands of the general surgeon not yet familiar with the operation the mortality is much higher than 7 per cent. Situations must arise during the operation which I am sure Dr. Gross will be able to tell us about, which make it extremely difficult in certain cases to perform the operation successfully. I am convinced that Dr. Stroud and the last discusser are correct that the importance of bacterial endocarditis as a complication has been overemphasized. This is almost of necessity so, because the most statistics are collected from the literature of reported cases. There is a glamor connected with bacterial endocarditis which would lead a physician having such a case to report it. The same patient dying of heart failure would not attract the same attention. We do not even know that this operation will

prevent the subsequent development of bacterial endarteritis on the site of the orifice of the patent ductus which has been obliterated, because the surface of the aorta at this point may be congenitally structurally defective and so still may acquire the infection later in life. I am not sure that nineteen years is long enough to follow these cases. I think it ought to be thirty-nine. I feel that at present the operative indication should include only cases which show evidence of cardiac insufficiency —that is, limitation of ability to exercise—cases that show considerable cardiac enlargement, especially those with progressive enlargement under observation and cases that show nutritional deficiency. If we operate for one of these three reasons, we have a sound reason for the operation because without it the patients will progressively grow worse. I should not operate on a patient who is apparently doing well, who is well nourished, who does not show signs of cardiac insufficiency and who does not have much cardiac enlargement.

DR. WILLIAM J. KERR, San Francisco: This operative procedure has opened up a new era in the study and treatment of heart disease. I wish to record an experience which I have had in two cases with operative procedures and to suggest that perhaps others will be found in the same category. The first patient was a woman in her twenties who was beginning to show signs of congestive failure with irregularities in rhythm. She had all the symptoms and signs of patent ductus arteriosus and probably had no other complications in the heart. At the time of operation, performed by Dr. Harold Brunn of San Francisco, it was rather difficult to find the patent ductus. Something was found which on having a ligature placed about it seemed to shut off the murmur and cause a change in the peripheral blood pressure readings at the time. The patient during the next several hours developed symptoms of severe infection, and Staphylococcus aureus haemolyticus was present in the fluid removed from the wound. The patient lived for two days. At autopsy it was found that there was no patent ductus arteriosus, but a fistulous opening connected the lumen of the arch of the aorta and the left branch of the pulmonary artery, the opening being 7 mm. in diameter, and it would not have been possible, excepting under procedures mentioned by Dr. Beck, I believe, to have separated the vessels and suture them. In connection with this case, which may be similar to one reported by Dr. Gross in which Staphylococcus aureus also was found, the question came up in my mind whether the staphylococcus came from the patient or from the audience; those who were inlookers at the time of this procedure may have brought the organisms to the patient. The other patient was a child who, following the operation, which was not difficult, continued to have a murmur although the peripheral signs and symptoms cleared up and apparently the child is in good condition. It brings up a problem which has been repeatedly raised and thought of by most of us. There may be multiple lesions. There may be some narrowing of the pulmonary artery or the pulmonary valve or an opening in the septum in these patients; but if it is adequate to carry on circulation, the patient certainly would be much improved.

DR. ARTHUR E. STRAUSS, St. Louis: There are two factors worthy of more emphasis. First, the factor of the type of bacterial endocarditis which we usually see in patent ductus arteriosus. We know from autopsy material—and it is confirmed by the experimental work on infectious endocarditis—that the site of the bacterial infection is usually the site of trauma, and the bacterial endocarditis in patent ductus arteriosus is usually originally located in the pulmonary artery opposite the inlet of the ductus. If that is the case and if these other infections of the valve are secondary, it seems at least reasonably possible that such bacterial endocarditis may be avoided if the constant trauma of this forcible aortic stream can be stopped by ligation. The other point has already been referred to twice, but from the clinical point of view it cannot be emphasized too strongly; that is, that the diagnosis of patent ductus arteriosus, while from the discussion seemingly simple, is not always so, and we cannot be sure in a great proportion of the cases that there are not other accompanying congenital anomalies.

DR. ROBERT E. GROSS, Boston: It is timely and valuable to have the study which Dr. Shapiro has presented. When combined with the recently published data summarized by Dr. Bullock of Los Angeles, we are now beginning to have a better idea of the prognosis in cases of patent ductus arteriosus. Dr. Shapiro has probably painted a too optimistic picture for the individuals who are left untreated. I know of a family with three children, each of whom has a patent ductus arteriosus. One died in early life, one now has subacute bacterial endocarditis and the oldest has ventricular fibrillation—making this a decidedly important lesion as far as this family is concerned. Many other cases could be cited to emphasize that the patent ductus is not always a harmless lesion. The World War veteran mentioned by Dr. Stroud raises a point regarding criteria for operation. I have an impression that an individual who reaches the age of 35 or 40 years without history or evidence of cardiac embarrassment or endocarditis is not likely to develop these at a later date. Hence operation should not be done after the third decade to prevent some theoretical future disability and should be done only if there are some very definite indications. Regarding the possibility of other cardiovascular abnormalities being associated with a patent ductus arteriosus, it is true that the loud murmur may overshadow the signs of other defects. However, in only one of our cases was there an associated abnormality, and in this instance the ductus was not acting as a compensatory mechanism. A word of caution is in order. The discussers have mentioned some of the pitfalls which may be encountered during or after these surgical procedures and it is obvious that this operation should not be performed without considerable deliberation. Furthermore, a surgeon who is not willing to study various forms of congenital heart disease, who does not familiarize himself with abnormalities which he may encounter in the operative field, who does not thoroughly learn the local anatomy and who does not practice the procedure on cadavers and animals should not risk the life of a patient by embarking on this undertaking, which may lead either to beneficial results or to a disastrous ending.

DR. C. SIDNEY BURWELL, Boston: You may think that this discussion has gotten away from the field of radiology, but I assure you it is not so. Many of the points brought up are concerned either with the diagnosis of patent ductus arteriosus or with the estimation of the severity of the disturbance of circulation associated with it. Judgment on both is much aided by the appropriate use of the radiologic evidence. The situation is something like this: A certain number of patients with patent ductus arteriosus die of subacute bacterial endarteritis. In general, these patients would not have this disease in the absence of patency of the ductus. There is therefore some reasonable ground for the hope that if the ligation of the ductus actually leads to a restoration of the integrity of the local structure the incidence of subacute bacterial endarteritis may be reduced. Only the passage of time and the observation of many patients will answer this question. Patients with patent ductus arteriosus take not only the risk of subacute bacterial endarteritis but also, although we do not know how frequently, the danger of heart failure or of long continued mild cardiac disability. The ingenious and successful operation devised by Dr. Gross has had one far reaching effect that no one has mentioned: it has stimulated enormously the interest in studying the problems of patent ductus arteriosus and of congenital heart disease in general. Two or three speakers have suggested today that there is a possibility that ligation of the ductus may be inadvisable in certain cases because such ligation may interfere with a compensatory function of the ductus. That is, it is suggested that the ductus arteriosus may in some cases play a useful role and permit the passage of blood essential for life. When the patent ductus is playing a useful role the lesions are such that the patient is cyanotic. Therefore, in the absence of cyanosis one need not be concerned lest ligation of the ductus abolish a useful function. Two final points: First, to emphasize again the originality displayed by Dr. Gross in his contribution. It has not only meant a lot to the lives of his patients but is going to mean a great deal to the knowledge of heart disease. Second, to thank the Section on Radiology for giving an opportunity to a group of men and women interested in heart disease to discuss these problems of such interest to themselves in this pleasant and instructive environment.

PREGNANDIOL EXCRETION FOLLOWING BILATERAL OOPHORECTOMY IN EARLY PREGNANCY

GEORGEANNA EMORY SEEGAR, M.D.
AND
ELEANOR DELFS, M.D.
BALTIMORE

Browne and Venning[1] first suggested that the excretion of pregnandiol could be used as a measure of progesterone production and therefore of corpus luteum function. Because the pregnandiol excretion increased markedly during pregnancy and disappeared completely at parturition, it was suggested that progesterone might be produced by the placenta after the second month of pregnancy. Browne and Venning[1] and Jones and Weil[2] have reported cases in which the corpus luteum of pregnancy was removed on the one hundred and twentieth and the fifty-fourth days, respectively, and the pregnandiol excretion subsequently remained within normal limits. These cases seem to lend additional support to the theory of a placental origin for progesterone during pregnancy. However, in both cases functional ovarian tissue remained.

It has recently been possible to study the pregnandiol excretion throughout pregnancy of a woman from whom all ovarian tissue was removed on the sixty-third day of gestation. Clinically this patient presented no abnormalities during pregnancy and parturition but the pregnandiol excretion never rose above the level usually found during the first ninety days; e. g., values comparable to those found during the luteal phase of nonpregnant cyclic women. Cyonin,[3] chorionic gonadotropic, assays were within the range of those found in normal pregnancies. These data are presented in the accompanying chart together with pregnandiol determinations performed in this laboratory on normal pregnant women for purposes of comparison.

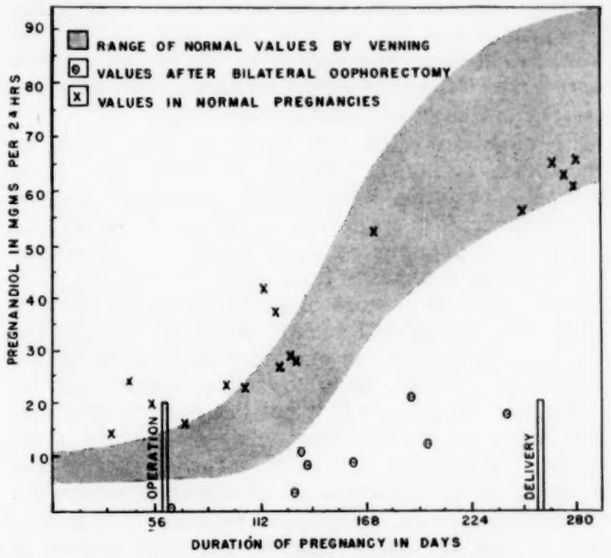
METHODS

The pregnandiol determinations were performed by the technic of Venning,[4] with several minor modifications designed to eliminate errors arising from the spontaneous hydrolysis of the pregnandiol complex to free pregnandiol. Collections were made into bottles containing 200 cc. of normal butyl alcohol each, the bottle being shaken well after the addition of each voided amount. Since hydrolysis of the glucuronide is negligible in butyl alcohol, most of the pregnandiol remains in the combined form. Any free pregnandiol which may have appeared during collection and extraction was recovered from the acetone solutions by a method described by Weil[5] and by Geschickter and Bucher.[6] The amount of free pregnandiol was then added to the calculated amount obtained in the combined form to give the total pregnandiol.

Assays of chorionic gonadotropin were performed on serum and urine by a method to be published.[7]

REPORT OF CASE

M. W., a Negro woman aged 26 who had had four full term spontaneous deliveries, was admitted to the hospital Sept. 12, 1939. Her past history was negative except that on May 29, 1939, she had had a left salpingo-oophorectomy performed because of chronic salpingitis and a cystic ovary. On admission she complained of slight intermittent vaginal bleeding during the preceding two weeks and severe pain in the lower part of the abdomen of two days' duration. Her menstrual history revealed that she had had only one menstrual period since her operation in May, the date of that period being July 2. Vaginal examination showed the cervix to be softened, the uterus somewhat enlarged and a tender cystic mass in the right fornix. A tentative diagnosis of ectopic pregnancy was made and an exploratory laparotomy was performed immediately, September 13. At operation the mass was found to be an ovarian cyst, and a right salpingo-oophorectomy was carried out. The uterus was noted to be enlarged and softened, giving the appearance of a uterus of early pregnancy. A Friedman test, performed on the day of operation, was reported to be negative. A twenty-four hour specimen of urine, collected September 14, sixty-three days after her last menstrual period, showed no pregnandiol. The patient made an uneventful recovery and left the hospital September 24.



A comparison of the pregnandiol values in milligrams per twenty-four hours in a case of pregnancy in which no ovarian tissue was present and values obtained on normal pregnancies during the same period. The normal range for pregnandiol during pregnancy, as obtained by Venning,[11] is also shown.

She returned to the dispensary November 1, at which time the uterus was found to be the size of a sixteen weeks pregnancy and the fetal heart was audible. She was admitted to the ward for study on November 11. A quantitative assay of serum gonadotropin showed 12,700 international units per liter and the urinary gonadotropin assay was read at 5,400 international units per liter. The twenty-four hour pregnandiol values at this time, on her 132d day of gestation, showed 3.4 mg. November 12, 11.8 mg. November 13 and 9.6 mg. November 14.

The remainder of the patient's antepartum course was normal in every respect, her only complaints being occasional hot flushes and slight abdominal pain. Blood pressure readings remained at about 124 systolic and 70 diastolic throughout her entire pregnancy. She had no vomiting, edema, headaches or visual disturbances. Her urine showed no albumin, casts or red blood cells. Pregnandiol determinations made at monthly intervals showed 8.6 mg. December 10, the 161st day of gestation,

From the Departments of Gynecology and Obstetrics, Johns Hopkins University and Hospital.

1. Browne, J. L. S.; Henry, J. S., and Venning, Eleanor H.: The Corpus Luteum Hormone in Pregnancy, J. Clin. Investigation **16:** 678 (July) 1937.
2. Jones, H. W., and Weil, P. G.: The Corpus Luteum Hormone in Early Pregnancy, J. A. M. A. **111:** 519 (Aug. 6) 1938.
3. Term proposed for gonadotropic hormone of placental origin by E. B. Astwood and R. O. Greep (Science **89:** 81 [Jan. 27] 1939).
4. Venning, Eleanor H.: A Gravimetric Method for the Determination of Pregnandiol Sodium Glucuronidate, J. Biol. Chem. **119:** 473 (July) 1937.
5. Weil, P. G.: Personal communication to the authors.
6. Geschickter, C. F., and Bucher, N. L. R.: Endocrinology, to be published.
7. Delfs, Eleanor, to be published.

21.3 mg. Jan. 9, 1940, the 191st day, 12.6 mg. January 17, the 199th day, and 18.4 mg. February 22, the 244th day.

A serum gonadotropin assay taken on March 6, 1940, showed 8,100 international units per liter.

Labor occurred spontaneously on March 26, fourteen days before the expected date of confinement. A normal female child was delivered by breech extraction and has since done well. The placenta delivered without difficulty. Grossly it was not remarkable. The weight was 515 Gm. and the dimensions were 18 by 18 by 2 cm. There were several subchorionic infarcts; the maternal surface was normal.

COMMENT

Strong support is lent to the theory that the corpus luteum hormone has an extra-ovarian source during the last two thirds of gestation by the fact that the patient continued to excrete pregnandiol in the urine during the last seven months of pregnancy following the removal of all ovarian tissue. The placenta seems to be the most probable source of the pregnandiol, although a different origin might be argued under these circumstances, as Beall and Reichstein [8] have isolated progesterone and allopregnanolone from adrenal extracts. Venning, Weil and Browne [9] have reported the presence of pregnandiol in the urine of two patients with an adrenogenital syndrome neither of whom had corpora lutea; Engel [10] has recovered small amounts of pregnandiol from large volumes of male urine.

The significance of the unusually low levels of pregnandiol cannot at present be evaluated. It is improbable that the determinations entailed a loss of the substance for, as shown in the chart, results in normal cases obtained at the same time approximate those given by Venning [11] for normal pregnancies. The presence of some obscure abnormality of the liver or kidney function of this patient which might interfere with the conjugatory or excretory mechanism of the pregnandiol complex is a possibility which must be considered. At present it is possible only to state that there were no demonstrable abnormalities in these systems. The placenta was of normal size and was producing normal amounts of chorionic gonadotropin.

Several theoretical possibilities remain. The first of these is that the ovary may be the main source of progesterone throughout pregnancy, the placenta producing only small supplementary amounts. This has generally been thought unlikely, on the basis of histologic evidence, as the regression of the corpus luteum, as judged by the microscopic appearance, begins at about the third month of pregnancy; that is, at a time when the pregnandiol level is beginning to rise. It cannot be denied, however, that a recognizable corpus luteum may persist throughout gestation.

A second possibility, for which there is no evidence at present, is that the ovary, although not the source, is at least concerned in the metabolism of progesterone during late pregnancy. Lastly, when a sufficient number of cases have been studied it may be found that the values obtained are not beyond the range of uncomplicated gestation. Browne [12] has found several cases with levels ranging from 10 to 15 mg. of pregnandiol at about the 130th day of gestation and feels that, although the values presented here are certainly low for normal pregnancy, they are not impossible.

In the case presented all ovarian tissue was removed on the sixty-third day of pregnancy. Clinically no abnormalities were observed during pregnancy or parturition. The excretion of pregnandiol, however, remained far below that found in a normal pregnancy; on only two occasions did it even slightly exceed values found in nonpregnant cyclic women. Cyonin, chorionic gonadotropin, determinations on blood and urine gave values comparable to those found in normal pregnancies.

8. Beall, D., and Reichstein, T.: Isolation of Progesterone and Allopregnanolone from Adrenal, Nature **142**: 479 (Sept. 10) 1938.

9. Venning, Eleanor H.; Weil, P. G., and Browne, J. L. S.: Excretion of Sodium Pregnandiol Glucuronidate in the Adrenogenital Syndrome, Proceedings of the 33d annual meeting of the American Society of Biological Chemists, April 26-29, 1939.

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DERRIS ROOT DERMATITIS

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Derris root or its extractives have been available in the United States for many years. In September 1911 the McDougalls applied for the first United States patent for its use as an ingredient for animal washes, insecticides and vermifuges.[1] The first reference to this root as an allergen was made by Westen [2] in 1937, when he reported improvement in two cases of bronchial asthma from exclusion of this substance from the environment. The sole reference revealed by a careful survey of the literature to derris as a cause of dermatitis was that of Racouchot [3] in 1939. Haag [4] states that he has on several occasions had inquiries about workers with derris who had contracted cutaneous lesions, but in none of these was the specific nature of the eruption given. From the information he received he was unable to ascertain the exact nature of the eruption.

REPORT OF CASE

F. K., a white man aged 27, married, was referred to one of us (M. D.) by Dr. D. R. McLean Dec. 12, 1939. For the past eight years he had worked as a florist's helper spraying insecticides on plants, cutting and bunching flowers and potting plants. He handled about forty different varieties of plants including chrysanthemums, pom-poms, lilies, hyacinths and tulips. November 20 he cut the palm of his right hand with a piece of glass. He applied iodine and covered the cut with adhesive tape. November 21 there developed an intense itching involving the legs, thighs, arms, forearms and genitals. There was some redness present in these regions but no other visible cutaneous lesions. He did nothing for the condition. He had been spraying flowers and plants for several days previously, and during the process his clothes became soaked with the spray. November 23 the penis began to swell. He went to a drug store, where the clerk sold him a bottle of a proprietary lotion, which he applied to his entire body and which soothed the skin. He also took some sodium bicarbonate baths. The following day he had a recurrence of the intense itching and he consulted a physician, who gave him a lotion (calamine). The itching was temporarily relieved by the application of the lotion and an ice bag. November 28 the itching was again very intense and the genitals became greatly swollen. He was hospitalized by the physician for five days, during which period the itching was greatly relieved. When first seen by one of us the patient stated that the itching was intermittent, occurring at irregular intervals during the day and night. It was also ascertained that five years previously he had a primrose dermatitis. The

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2. Westen, C. G.: J. Allergy **9**: 62 (Nov.) 1937.
3. Racouchot, Jean: Arch. d. mal. profess. **2**: 149 (March) 1939.
4. Haag, H. B.: Personal communication to the authors.

patient's family history for allergy was negative. He stated that he had never had any other disease of the skin.

Examination December 12 revealed a number of discrete follicular papules and pustules on the thighs, legs and popliteal spaces and over the sacrum. There was a patch of erythema in each cubital fossa. There was marked dermographism. These features suggested the possible allergic nature of the dermatitis. The history suggested insecticides as the possible cause. To identify the cause, further study was undertaken.

Patch tests were performed with the substances which the patient handled.

After forty-eight hours the patches were removed and revealed no reactions. Subsequently, allergic investigation was undertaken (T. B. F.) and tests to derris and pyrethrum by the scratch technic gave negative results. Intracutaneous tests elicited a marked reaction to a 1:1,000 solution of derris extract. Passive transfer tests were performed, and circulating antibodies were demonstrated in three different subjects who gave no reaction in their control sites.

On complete avoidance of contact with insecticides containing derris, the patient has made an uneventful recovery and has remained free from symptoms although working at his occupation to date (March 1940).

HISTORICAL SURVEY

The roots, bark and shrubs of the Lonchocarpus family originally came from the Malay Peninsula but are now cultivated in large amounts in Brazil and Peru. This family of plants has served the natives of the Malay Islands and those of the Amazon region since ancient times. The natives apparently knew of its lethal powers for a much longer period than that of curare and used it to make a poison for arrows. The animals struck would die in a few minutes, but their flesh would remain edible because practically none of the poison is assimilated by the digestive tract. The natives have also used this poisonous root to catch fish. The poison is a fish toxin of almost unbelievable power—a dilution up to 300,000 serves to anesthetize and kill a quantity of large fish in a few minutes. The fact is more surprising since the ichthyotoxic principle of derris is only slightly soluble in water.

Results of Patch Tests with Substances Handled by the Patient

		24 Hrs.	48 Hrs.
1. Hitox	1:600 in water	0	0
2. Loro	1:600 in water	0	0
3. Multicide	1:600 in water	0	0
4. Derrisol	1:600 in water	0	0
5. Chrysanthemum, leaf and petal		0	0
6. Pom-pom, leaf and petal		0	0

Substances 1 to 4 are insecticides. Their ingredients are as follows:
Hitox: rotenone, pyrethrum, vegetable oil.
Loro: alipathic thiocyanates, principally lanryl, 50%; thiocyanate sulfur, 5.75%; aliphatic sulfonates, 40% (combined sulfur 0.4%); inert ingredients 10%.
Multicide: water, 14%; pyrethrum extractive, 18%.
Derrisol: derris resin, 5%; fatty acids, 50%; inert matter, 45%.

The farmers of China, Java and Ceylon were apparently the first to recognize the remarkable insecticidal properties of the rotenone-containing plants and use the poison extensively in their horticulture. The use of these insecticidal plants in modern agriculture has spread rapidly because they are not as toxic to man or animals as are the insecticides containing arsenic, lead and copper.

BOTANY

Roark[5] deals fully with the botany of derris and allied plants in his monograph on Lonchocarpus, which is a genus of tropical shrubs comprising some sixty species. However, only four known species and three suspected species have insecticidal properties. The two most commonly employed commercially are cubé root (Lonchocarpus nicou) and derris root (Derris elliptica).

TOXICOLOGY

Studies have been reported by Ambrose and Haag[6] on the chronic toxicity of derris (Derris elliptica) for rabbits, dogs and rats. Rabbits given 60 mg. per kilogram and more showed signs of cumulative toxicity. In adult dogs on a diet containing 0.04 per cent of derris, no symptoms of toxicity were observed. In young growing dogs on the same diet, the most pronounced effect was the stunting of growth. Diets containing less than 0.0312 per cent of derris had no demonstrable effect on the growth of rats. As the concentration of derris in the diet was increased, the inhibition in growth was more marked. Pathologic studies of the tissues of dogs and rats indicated that derris, in all concentrations studied, was somewhat injurious, the liver being the only organ consistently affected.

Haag[7] was so convinced of the harmlessness of rotenone that he took 150 mg. by mouth without experiencing any harmful effects.

SOURCES OF CONTACT

In view of the fact that the plants of the derris family are now being cultivated in the American countries and because of their superior insecticidal properties and apparent absence of toxicity when ingested by human beings, they are rapidly replacing the arsenical and mercurial insecticides. A number of insecticides, animal washes and vermifuges containing derris root or its extractives are now available in the American markets.

COMMENT

Racouchot[3] reported a series of cases of dermatitis occurring in workers who ground the dry derris root into a powder which was used as an insecticide. The workers handling the powder presented in two or three days a violent dermatitis of the genital region. The scrotum became reddish violet and markedly edematous, and the natural folds became exaggerated. The skin of the penis and prepuce was erythematous and cut with shallow fissures. The pruritus was intense. After forty-eight hours, when contact with the powder was avoided, the irritated skin desquamated in large and small plaques, and all conditions returned to normal. If the noxious contact was continued, the dermatitis became aggravated but did not extend farther than the genitocrural fold. The pruritus was intensified and the erythema increased. The skin was covered with large, flat papules *en pastille* about 0.5 cm. in diameter, excoriated and weeping. The prepuce was edematous and weeping. The dermatitis returned with each new exposure. All the cutaneous reactions (patch tests?) were negative and the skin of the genital region alone was affected. He thought this was due to the fineness of the skin and to the constant humidity and oiliness of this location. The active principles of cubé are, in fact, much more soluble in oily mediums than in water. He instituted prophylaxis in the grindery with excellent

5. Roark, R. C.: Bulletin E-367, U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine, 1936.

6. Ambrose, A. M., and Haag, H. B.: Indust. & Engin. Chem. **30**: 592 (May) 1938.

7. Haag, H. B.: J. Pharmacol. & Exper. Therap. **43**: 193 (Sept.) 1931.

results. A closed ventilating system was installed and the grinders were modernized. Each worker received a gas mask of the small type to cover the mouth and nose. This type of mask is sufficient because the derris dust apparently did not cause conjunctivitis. He placed in each mask a moistened marine sponge about 2 cm. thick, which served very well to stop the powder. Other symptoms that he noted were irritation of the mucosa and an ulcerative, scabby rhinitis with a transient but complete anosmia. In a few instances it irritated the lips like a pigment, as well as the tongue, and produced in it anesthesia followed by a very disagreeable and severe pain. With the mask these sense organs recovered their functions. There has not been a single case of laryngeal or pulmonary complication. A guinea pig has lived for six months in the pure powder at the site of the grinders without being made ill. Each worker is furnished with a special closure for his fly and about the ankles. With these precautions and with the proper body care, he observed no further accidents.

Our patient when seen presented a residual dermatitis but gave a history of a symptom complex involving chiefly the genitalia analogous to that described by Racouchot.

We feel that our case is not a contact dermatitis, but rather a true allergic dermatitis. It is our interpretation that the cases described by Racouchot are of the same type, since the workers were able to resume their regular occupation without recurrences when protected by gas masks and working in modernized and properly ventilated rooms.

SUMMARY AND CONCLUSIONS

1. A case of dermatitis was due either to the inhalation of an insecticide containing derris extractives or to absorption through lacerated skin.
2. There are various sources of possible contact with derris, a plant of the Lonchocarpus family.
3. It was shown that this substance is not a primary cutaneous irritant in the dilutions ordinarily employed.
4. It was shown by negative patch tests that this substance is not a contact irritant.
5. This substance produces dermatitis by a true antigen-antibody reaction, as indicated by positive intracutaneous tests and by positive passive transfer reaction.
6. Avoidance of exposure appears to be the method of prevention for sensitive individuals.
7. Dermatitis is apparently rare in spite of the widespread use of derris.

104 South Michigan Avenue.

Disease and Illness.—Disease is only one element of illness and is not the only cause of disturbances of the activities and functions of the body. There is in fact no fixed relationship between disease and illness. Disease does not necessarily cause illness, and illness may exist without disease. Free and efficient living is dependent on the conditions under which a person lives as well as on his physical state. Just as an automobile may run perfectly along a smooth and level road but give out unexpectedly on a hill, so illness may be precipitated by the burden an individual is forced to carry, placed on him by the conditions of his work, by the people who surround him or by the circumstances of his existence. Illness results from disturbed bodily functions, and its character, duration and severity are dependent not alone on the physical causes of these disturbances but also on the characteristics of the patient as an individual and on the total situation of which he is the center.—Robinson, G. Canby: The Patient as a Person, New York, Commonwealth Fund, 1939.

Clinical Notes, Suggestions and New Instruments

SUBACUTE STREPTOCOCCUS VIRIDANS ENDARTERITIS COMPLICATING PATENT DUCTUS ARTERIOSUS

RECOVERY FOLLOWING SURGICAL TREATMENT

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The two serious complications of patent ductus arteriosus that occur most commonly are (1) cardiac failure due to the alteration of circulatory dynamics and (2) subacute bacterial endarteritis resulting from implantation of organisms at the site of the congenital abnormality. Gross,[1] in an attempt to correct circulatory abnormality and in the hope of preventing the future development of subacute bacterial endarteritis, was the first successfully to ligate a patent ductus. Since the report of this case in February 1939, Gross and Hubbard[2] have recorded eight additional operative cases and Bullock, Jones and Dolley[3] a series of eleven. The results in these twenty cases have demonstrated conclusively that ligation of the patent ductus is effective in correcting circulatory abnormality.

Up to the present, subacute bacterial endarteritis complicating patent ductus has been treated by medical methods identical with those employed in cases of subacute bacterial endocarditis. It may be stated that such treatment in general has been unsuccessful. In May 1938, Graybiel, Strieder and Boyer[4] reported a case in which an attempt at cure was made by surgery. Because of technical difficulties, their plan of ligating the patent ductus could not be carried out and the structure was plicated by external sutures in an effort to obliterate the lumen. The patient died on the fourth postoperative day of acute gastric dilatation, and at postmortem examination the ductus was found to have been incompletely occluded. Aside from this report we have found no record of any attempt at cure of the infection by surgical methods. Our purpose in this communication is to report a case of patent ductus arteriosus complicated by subacute Streptococcus viridans endarteritis in which recovery apparently has followed operation. To the best of our knowledge, this is the first such case to be recorded in the literature.

REPORT OF CASE

History.—S. S., a native born white woman aged 29, single and an office worker, was admitted to the medical service of Beth Israel Hospital, Jan. 20, 1940. The patient was one of five siblings, none of whom suffered from any known congenital anomaly. She had been told that a cardiac murmur had been present since birth but that she had not been a "blue baby." During her childhood, although she was warned against engaging in strenuous games, she skated, swam and played ball. She was able to do these things without manifesting unusual distress or shortness of breath. At the age of 8 she underwent a tonsillectomy. At the age of 14 she suffered a mild attack of typhoid. Since then she had been quite well until the onset of the present illness.

About two and one-half months prior to admission to the hospital she became nervous, irritable and easily fatigued. These symptoms were progressive and she soon lost her appetite and she began to vomit and to lose weight. Although she did not take her temperature, she "felt warm" and perspired freely on a number of occasions. Two weeks before admission a nonproductive cough developed. One week later, and again on the day of admission, she had a chill. During the illness, the weight fell from 95 to 88 pounds (43 to 40 Kg.).

From the Medical Service of Dr. Albert A. Epstein and the Surgical Service of Beth Israel Hospital.

1. Gross, R. E., and Hubbard, J. P.: Surgical Ligation of a Patent Ductus Arteriosus, J. A. M. A. **112**: 729 (Feb. 25) 1939.
2. Gross, R. E., and Hubbard, J. P.: The Criteria for Ligation of the Patent Ductus Arteriosus, lecture before the Section of Pediatrics, New York Academy of Medicine, Jan. 11, 1940.
3. Bullock, L. T.; Jones, J. C., and Dolley, F. S.: The Diagnosis and Effects of Ligation of the Patent Ductus Arteriosus, J. Pediat. **15**: 786 (Dec.) 1939.
4. Graybiel, Ashton; Strieder, J. W., and Boyer, N. H.: An Attempt to Obliterate the Patent Ductus Arteriosus in a Patient with Subacute Bacterial Endarteritis, Am. Heart J. **15**: 621 (May) 1938.

Examination.—The patient was pale, thin and underdeveloped. She was acutely ill. The temperature was 103.4 F., pulse rate 144 and respiratory rate 18. There was no dyspnea or cyanosis. No petechiae were present in the fundi or conjunctivas nor on the body or extremities. The pharynx was not injected, the teeth were in good repair and cervical lymph glands were not palpable. The main features of interest were found on examination of the heart. The lattter was not enlarged. The point of maximal apical impulse was situated in the fifth interspace in the midclavicular line. A short, blowing systolic murmur was heard over the apex and over most of the left precordium. In the second interspace, immediately to the left of the sternum, a moderately loud machinery-like murmur replaced the first sound. This murmur continued through the second sound and apparently through most of diastole. It also could be heard in the first and third left interspaces, immediately outside the apex and between the mesial border of the left scapula and the vertebral column. The pulmonic second sound was accentuated. Over the aortic area the sounds were normal. There was no evidence of cardiac failure.

The lungs were clear; the spleen was barely palpable. There was no clubbing of the fingers. The blood pressure was 98 systolic, 60 diastolic, and on the five succeeding days 94/66, 110/66, 110/72, 110/70 and 108/68.

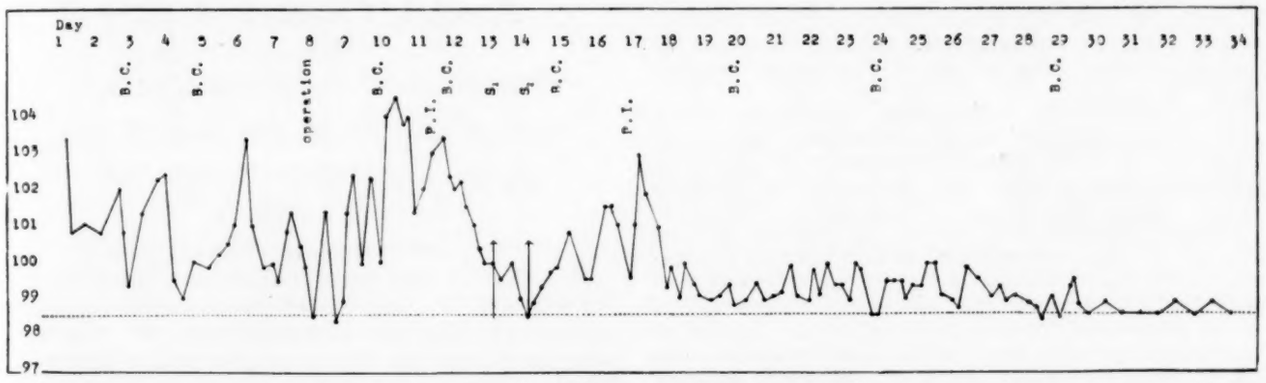
Laboratory Data.—A teleroentgenogram revealed the heart to be of normal size but somewhat oval. There was some prominence of the arc of the pulmonary artery and left auricle, with straightening of the left cardiac border. Moderate pulmonary vascular congestion was present. Kymographic examination indicated very marked pulsation of the pulmonary artery. The four lead electrocardiogram was normal; left axis deviation was present. A phonocardiogram revealed the murmur over the pulmonic area to be continuous through systole and diastole, except for a short period of silence during presystole. The specific gravity of the urine ranged up to 1.020. Albumin and dextrose were absent. An occasional red blood cell was seen in the low power field. The benzidine test was repeatedly negative. No casts were found. The blood contained 3,850,000 red cells per cubic millimeter. Hemoglobin content was 74 per cent. There were 17,500 white cells, of which 69 per cent were polymorphonuclear leukocytes and 31 per cent mononuclear cells. The erythrocyte sedimentation rate was 45 mm. in forty-five minutes. The Wassermann, Kline and Kahn tests gave negative results. A blood culture taken two days after admission revealed 50 colonies of Streptococcus viridans per cubic centimeter after twenty-four hours incubation and 400 colonies per cubic centimeter after forty-eight hours. Another blood culture taken two days later yielded heavily positive results in the flasks but plates were not inoculated. The diagnosis of patent ductus arteriosus with complicating subacute Streptococcus viridans endarteritis was made.

The patient was observed for seven days, during which time the clinical course was of the septic type, with sweats and irregular fever ranging between 99 and 103.4 F. During this period the only medication administered was acetylsalicylic acid and phenobarbital.

In the past at our institution attempts to cure subacute bacterial endocarditis by means of drugs or hyperthermia had been unsuccessful. Accordingly, surgical therapy was considered and seemed warranted for various reasons. It was postulated that if the vegetations were confined to the ductus, excision of the latter might result in recovery. If the vegetations were situated in the ductus, pulmonary artery and right side of the heart, it was hoped that excision or ligation of the ductus would promote healing of the lesions by eliminating the arteriovenous communication and the swirling current of blood. It was further suggested by Dr. Emanuel Libman, who saw the patient in consultation, that the shutting off of the flow of oxygenated blood from the aorta into the pulmonary artery might render conditions less favorable for the growth of vegetations in the pulmonary artery and right side of the heart.

It was realized that operation presented certain dangers such as infection of the pleura and mediastinum, accidental hemorrhage from the friable infected ductus and dislodgment of infected thrombi into the circulation. However, in view of the otherwise almost hopeless prognosis, it appeared warranted to take these risks. With the understanding, on the part of the patient's relatives, that the procedure was experimental, but under the circumstances worthy of trial, operation was undertaken seven days after admission.

Operation.—On Jan. 27, 1940, an operation was performed (by A. S. W. T.) under intratracheal cyclopropane anesthesia. A left-sided anterior thoracic incision was made, from the sternum to the anterior axillary line in the third intercostal space. The second and third costal cartilages were divided and the pleural cavity was entered. By retracting the divided ribs upward and permitting the lung to collapse, an excellent exposure of the aortic arch and the left pulmonary pedicle was obtained. An extensive tremor and thrill were noted over the exposed surface of the heart. The thrill also was palpable over the root of the aorta and the region of the pulmonary artery. Through a directly applied sterile stethoscope a very loud, harsh, whirring murmur could be heard over these areas throughout the cardiac cycle. A 4 cm. incision was made in the mediastinal pleura below the aortic arch, and the under surface of the arch, ductus arteriosus and pulmonary artery were freely exposed. The ductus measured about 14 mm. in length and 10 mm. in diameter; the pulmonary artery was markedly dilated. The thrill and murmur previously described were now detected directly over these two structures. The left recurrent laryngeal nerve was identified as it passed beneath the junction of the ductus and aorta. The ductus next was isolated, except on its deep surface, where it was quite adherent. With some difficulty the deep surface was freed, and a strand of heavy silk on a ligature carrier passed beneath it. As gentle upward traction was made on the untied ligature, vigorous and profuse bleeding suddenly began from the depths. Although the source of the hemorrhage was not visible, it was assumed to be due to a tear in the deep surface of the ductus. In view of the fact that only the gentlest traction had been made, it was further assumed that the wall of the ductus was very friable. With difficulty, bleeding was temporarily controlled by pressure, and clamps were applied to the ductus. The structure then was rapidly dissected free and divided completely. The upper end was ligated with a heavy silk ligature immediately adjacent to the aorta and the lower end similarly ligated adjacent to the



Patient's temperature course in hospital. *B. C.* indicates blood culture; S_1, sulfapyridine; S_2, sulfapyridine stopped; *P. I.*, pulmonary infarction.

pulmonary artery. Because of assumed contamination of the operative field from the divided ductus, the incision in the mediastinal pleura was not sutured. Immediately before the thoracic closure was completed the lung was expanded with positive pressure.

Concomitant with the severe hemorrhage during operation, the blood pressure and pulse became almost imperceptible and the patient went into shock. After an immediate intravenous infusion of acacia, followed by a transfusion of 500 cc. of citrated blood, improvement was noted, but her condition was still precarious at the end of the operation.

Postoperative Course.—On her return to the ward two transfusions of 500 cc. each were administered within a period of several hours. Within another few hours evidence of shock had disappeared. During the first few days intranasal oxygen was administered at intervals to control transient episodes of dyspnea and cyanosis. Several hundred cubic centimeters of serosanguineous fluid was aspirated from the left side of the chest on the third, fourth and ninth postoperative days. Cultures of these fluids subsequently were reported negative. On the second postoperative day the temperature rose to 104.4 F. but thereafter receded, except for transient rises, to 103.4 F. and 103 F., on the fourth and ninth postoperative days respectively, concomitant with minor episodes of right-sided pulmonary infarction. From the tenth to the eighteenth day after operation, the temperature did not rise above 100 F. From the nineteenth to the twenty-sixth day, when the patient was discharged from the hospital, the temperature gradually returned to normal. The wound healed by primary union, all sutures being removed on the fifth postoperative day. The patient was allowed out of bed on the twelfth day after operation.

Six postoperative blood cultures were taken (on the second, fourth, seventh, twelfth, sixteenth and twenty-first days respectively) and all remained sterile throughout fourteen days of incubation. Some of these blood specimens were arterial as well as venous; some were anaerobic as well as aerobic.

It was planned to withhold chemotherapy following operation in order to observe the effect of surgery alone on the bacteremia. However, because of fear of the development of mediastinal and pleural infection, sulfapyridine was administered on the afternoon of the fifth postoperative day. Six Gm. of the drug was given on that day, and 3 Gm. on the following day, at which time it was discontinued because of persistent vomiting. It is to be noted that when the administration of sulfapyridine was begun the temperature was subsiding and was down to 100 F. and that the two postoperative blood cultures taken up to that time had been reported sterile. It therefore appears highly unlikely that the drug had any significant effect on the bacterial infection. When the patient was discharged from the hospital on the twenty-sixth postoperative day, she was symptom free, had gained 3 pounds (1,360 Gm.) and appeared in good physical condition. At that time she was referred to a convalescent home with instructions to return to the hospital in three weeks.

During a twenty-two day stay in the country, the temperature, taken daily, remained normal; she gained 7 pounds (3,175 Gm.) and felt entirely well. She was readmitted to the hospital forty-eight days after operation for a check-up investigation. During a three day period of observation in the hospital the rectal temperature, taken twice daily, was 98.6 F. on each registration. The blood pressure was 110/70, which was essentially the same as before operation. Of great interest was the persistency of the continuous murmur [5] over the pulmonic area. Its intensity had diminished somewhat, however, and it was more circumscribed than it had been previously. The spleen no longer was palpable. Slight hoarseness due to partial loss of function of the left vocal cord was present. The urine was normal. No red cells were observed and the benzidine test gave negative results. The blood count was normal. The hemoglobin content was 102 per cent. The sedimentation rate was 5 mm. in forty-five minutes. A blood culture revealed no growth. The four lead electrocardiogram was identical with the one taken before operation. On the basis of the observations, the assumption that bacterial infection still was absent was warranted. Accordingly, the patient was discharged and permitted to return to work. When last examined on March 30, 1940, exactly nine weeks after operation, she appeared in excellent health.

5. As the result of observations made during operation in this case, and subsequently in three similar cases, it appears that in adults suffering from patent ductus arteriosus complicated by subacute bacterial endarteritis the continuous murmur, although originating in part in the patent ductus, is generated principally in the dilated pulmonary artery. The details of the observations on which this statement is based will be published in a future communication.

SUMMARY

A woman aged 29 had patent ductus arteriosus with superimposed subacute Streptococcus viridans endarteritis. During a seven day period of hospital observation the clinical course appeared severe. Blood cultures revealed as many as 400 colonies of Streptococcus viridans per cubic centimeter. Operation was performed primarily in the hope of eliminating the infection. The procedure consisted of division and double ligation of the ductus. Severe hemorrhage occurred at operation, but the postoperative course otherwise was essentially uneventful. Nine weeks has elapsed since operation.[6] All postoperative blood cultures, seven in number, have been sterile. This is the first successful ligation of a patent ductus arteriosus complicated by subacute bacterial endarteritis to be reported. It is also the first such case in which recovery from the bacterial infection apparently has resulted.[7]

940 Park Avenue.

6. Since this paper was submitted for publication another eleven weeks has elapsed. During the period of twenty weeks since operation, the patient has been kept under close observation and remains in excellent general physical condition and free of all evidence of infection.

7. Three additional cases of patent ductus arteriosus complicated by subacute bacterial endocarditis have come to operation. The results in these cases will be presented in a forthcoming issue of the Journal of Thoracic Surgery.

Read in the General Scientific Meetings at the Ninety-First Annual Session of the American Medical Association, New York, June 10, 1940.

Special Clinical Article

THE DRAMA OF TUBERCULOSIS

CLINICAL LECTURE AT NEW YORK SESSION

JAMES ALEXANDER MILLER, M.D.

NEW YORK

THE HUMAN DRAMA

The effect of long drawn out chronic illness on life and character is well known to physicians and has appealed to historians, dramatists and story tellers in many lands, through various tongues and in numerous forms.

Many are the famous personages in various walks of life whose careers have been influenced by personal experience with tuberculosis. To enumerate only a few we may note:

In literature, Schiller, Keats, Byron, Thoreau, Brontë, Elizabeth Barrett Browning, Robert Louis Stevenson and Eugene O'Neill.

In music, Chopin, Paganini, Mozart and von Weber.

In art, Raphael, Molière and Rachel.

In philosophy, Voltaire, St. Francis of Assizi and John Calvin.

Among statesmen, Cicero, Cecil Rhodes and Kerensky.

Among military leaders, Lord Nelson and John Paul Jones.

In science, Descartes, Priestley and Luther Burbank.

In medicine, Laënnec, Ehrlich, Benjamin Rush and Trudeau.

Much has been written of the tuberculous temperament and many have accepted this suggestion as a definite fact with wide implications. Such a specific influence on temperament is extremely doubtful. There

can be little doubt that a long struggle with such a serious chronic disease had a profound influence on the character and career of those mentioned as well as of thousands of less favored folk. Success in overcoming such a physical handicap not only demands courage but it develops strength of character and increased confidence to meet the other problems of life.

Even in failure, fate may be conquered by the development of acquiescence and a philosophic calm which gives inspiration to all about one and thus enables the spirit to triumph not only over disease but over death itself.

Interpreted in this sense, tuberculosis has undoubtedly profoundly affected the lives and careers of many to their own betterment and to the great advantage of mankind.

The story of the lives of these and other great men and women is each a stirring drama with a universal appeal.

This has been widely recognized in many works of nonhistorical literature where art has served to dramatize more highly the human elements of struggle, of disappointment, of success or of tragedy. Of these none is more widely known and appreciated than Dumas's romantic play La Dame aux camélias, or Camille, the story of which has also been dramatized in opera by Puccini in La Bohème.

The dramatic appeal of tuberculosis is recognized as a general one, directed to the imagination and sympathies of all but especially to physicians who through the long history of our profession have witnessed the patience, the courage, the tragedy of many grim struggles and often the eventual triumph.

The human side of our professional contacts has enriched our experience, has strengthened our faith in human nature and has developed our spiritual as well as material resources to help others combat this disease.

THE MEDICAL DRAMA

Fascinating as is the human story of this age long disease, it is the story of the gradual development of our knowledge of it that is of especial interest and concern to a gathering of physicians such as this. I therefore will address myself to a brief review of that history. This too is a drama of intense professional as well as human interest.

Such a historical review has the endorsement of Sir William Osler, who once wrote: "By the historical method alone can many problems in medicine be approached profitably. For example, the student who dates his knowledge of tuberculosis from Koch may have a very correct but a very incomplete appreciation of the subject."

EARLY HISTORY

References to tuberculosis are recorded in Persia and Egypt as far back as 2000 B. C. but it is not until the time of Hippocrates, 450 B. C., that any important medical records are available. While Hippocrates made some very keen clinical observations, as in his clear picture of pneumothorax and his emphasis on the value of rest, of a milk diet and of climatic change in the treatment of pulmonary tuberculosis, his theory of its causation was the aspiration of mucus from the brain and he conceived of its pathology as tumors of the lung with a tendency to suppurate.

Hippocratic medicine extended from Greece to Rome, where Galen, 150 A. D., was the dominating figure. His conception of the disease was that of ulceration rather than tumor formation and he thought that it was caused by the corrosive action of tissue fluids.

Galen's ideas prevailed for 1,600 years. They were preserved and practiced in very crude forms almost exclusively in the monasteries during those long dark ages.

In the seventeenth century came the revival of learning, in which medicine shared. The advance of medical knowledge came primarily from postmortem examinations long proscribed by religious opposition and the first leaders were in Holland, notably Sylvius and Boerhaave, and in England, Willis. Thus was gross pathologic anatomy first established as the fundamental basis of scientific medicine.

In the eighteenth century the possibility of the communicability of tuberculosis was first recognized in Spain and later in Naples, where the first quarantine against the disease was established. In physical diagnosis the first great step was taken in 1761 by Auenbrugger, who introduced percussion as a valuable method in the physical examination of the chest.

In 1790 Baillie in London after careful anatomic studies expressed his belief that tuberculosis and scrofula were the same disease, a fact hitherto disbelieved.

THE NINETEENTH CENTURY

The nineteenth century developed medical knowledge to an extent and at a tempo never before known. The earlier decades were dominated by France. Bayle in 1810 classified pulmonary tuberculosis so as to simplify greatly clinical thought and laid the foundation for the astounding contributions of Laënnec, who in a few brief years coordinated the pathologic and clinical concepts of tuberculosis, crystallized them into one of the great medical classics, Traité de l'auscultation médiate et des maladies des poumons et du cœur, published in 1819, which stands today as a work unexcelled for accuracy and clarity of description. Incidentally he invented the stethoscope, for which feat he is perhaps most widely known and then he tragically died at the age of 45 from the very disease which he was the first to understand adequately and to describe.

Following Laënnec, Louis carried on his great French tradition of careful physical examination of the chest and, in Vienna, Skoda added notable contributions in the 1830's.

In 1843 Sir James Clark in England reemphasized climatic treatment especially in the mild environment of Madeira and the Riviera.

It was at this time that pathologic histology first began to be studied because of the development of the microscope.

Virchow in Berlin led the way in these studies, and in 1847 he gave the first accurate histologic description of tuberculous lesions. Master as he was, he still clung to some of the old erroneous theories, for example that tubercle was caused by irritation and that tuberculosis and phthisis were distinct and separate entities. As late as 1866 one of Virchow's students, Niemeyer, uttered the famous dictum "The worst thing that can happen to a case of phthisis is to develop tuberculosis."

The center of progress then shifted back again to France through the remarkable researches of Villemin from 1862 to 1867. The name of this brilliant investigator has been extraordinarily neglected in the history of tuberculosis. By clinical investigation supported by

animal experimentation he strongly opposed the then accepted theory of a diathesis as the cause of the disease and came to the conclusion that it was due to an extraneous agent of a virus nature. He considered tuberculosis comparable to syphilis and glanders and that it was a zymotic disease which was communicable and he proved that this communicability was accentuated by overcrowding. As a result, he suggested measures of prevention by the improvement of environment and by protection from exposure to known sources of infection. Villemin was thus the logical forerunner of Robert Koch and the bacteriologic era.

THE BACTERIOLOGIC ERA

The revolutionary discoveries of Pasteur, begun in 1870, laid the foundations of bacteriology and led to the knowledge of the causation of tuberculosis as well as of many other infectious diseases. Thus was begun the astoundingly rapid development of modern medicine, i. e., within the lifetime of some of us here present. Pasteur himself did not investigate tuberculosis but it was inevitable that his ideas of bacterial infection should have immediately directed attention to tuberculosis because of the suggestive facts already established by the investigations and theories of Villemin. Laboratory studies were prosecuted feverishly under the exciting stimulus of the new knowledge but tuberculosis proved a more difficult problem than some other diseases and it was not until 1882 that Robert Koch announced his proved discovery of the tubercle bacillus as the cause of tuberculosis. It is interesting to note that within a few months of Koch's announcement Baumgarten and a few months later Aufrecht published the fact that they too had recognized the germ of tuberculosis and there can be no doubt that these investigators discovered the tubercle bacillus coincidentally with and independently of Koch. Koch, however, has always been credited with the discovery because of the priority of his publication and also because his announcement was made in a paper which was a masterpiece of scientific description and logical thought.

This paper, entitled Die Aetiologie der Tuberculose and published in the *Berliner klinische Wochenschrift* April 10, 1882, is another of the great classics of medical literature. It is to be noted that these discoveries were materially aided by the use of the staining qualities of the aniline dyes developed by the researches of Paul Ehrlich.

The cause being known, naturally thoughts and hopes turned to the discovery of a cure for tuberculosis and by none more energetically than by Koch himself. In 1890 he electrified the world by the discovery of tuberculin, his experiments leading him to the belief that in it might be a specific cure. The excitement was intense. Welch, who was then professor of pathology and bacteriology in New York, sent his promising young assistant Hermann M. Biggs to Berlin and he brought back to America the first supply of "Koch's lymph," as it was then called. Trudeau in his isolated makeshift laboratory at Saranac Lake caught the spirit and began his lifelong clinical and animal experiments with tuberculin. All over the world scientists, physicians and laymen alike were in a highly excited state of eager expectancy that the cure for the greatest cause of disease and death was at hand. Slowly came the disillusionment, and it is a sobering reflection on the dangers of premature optimism that now, fifty years later, in spite of countless experiments and many collateral additions to our knowledge, a specific cure of tuberculosis still eludes us.

The discovery of tuberculin however had real value, for through it as well as by bacillus inoculations Koch developed our knowledge of the variation in tissue reactions between primary and secondary infections, the so-called Koch phenomenon, and particularly later through its use as a diagnostic test, as developed in 1907 by Pirquet and Calmette.

Toward the end of the century the value of sanatorium treatment for tuberculosis, which was first instituted by Brehmer in 1853 and later by Dettweiler in 1874, became more generally recognized and the first sanatorium in the country was founded by Trudeau at Saranac Lake in 1884.

In 1895 Roentgen's discovery of the x-rays marked the beginnings of what was to become the invaluable diagnostic agents which they are today, and in 1894 Forlanini's early clinical experimentation with artificial pneumothorax, which later revolutionized the treatment of many cases of pulmonary tuberculosis.

THE MODERN ERA

We have thus seen that important beginnings in our present knowledge were made toward the end of the nineteenth century, but the extension of our knowledge and its practical application was rapidly and generally developed only after 1900, so that we may properly designate the last forty years since the turn of the century as the modern era. During this time progress in general medicine and especially in tuberculosis has been breath taking in its rapidity. The astounding details of this part of the story are, however, so well known that it will be profitable to review only briefly the high lights of this period.

Von Behring had just postulated the concept that adult tuberculosis derived its origin from childhood infection and in 1912 Ranke built on this and the pathologic studies of Ghon his philosophical treatise on the pathogenesis of the disease outlining three stages, the primary affect, the dissemination phase and lastly the localization in individual organs, especially the lungs. This laid the basis for the modern concept of the endogenous origin of phthisis.

Early in the century Koch and Theobald Smith entered into their famous controversy concerning the distinctive variation between human and bovine bacilli, in which Smith proved his contention of their essential cultural and biologic differences. From these and other researches developed the program for the control of tuberculosis in cattle and the pasteurization of milk, the success of which has almost eliminated certain forms of tuberculosis in man, notably so-called surgical tuberculosis.

One of the notable achievements of this early twentieth century era was the organization of the antituberculosis campaign of education and prevention. In this country under the scientific and medical leadership of such men as Biggs, Welch, Trudeau, Osler, Flick and Knopf this campaign was crystallized into the National Tuberculosis Association, which organized a combined medical, social and lay crusade which now has units in every community, with the far reaching effects with which we are all familiar.

One of the most important results was the emphasis placed on the institutional segregation of infectious

cases, with the rapid increase of sanatorium and hospital beds to nearly 100,000 in the United States.

As an infectious disease tuberculosis became a chief concern of public health authorities, who, aided and encouraged by nonofficial agencies, developed the sanitary control regulations as we know them today. Biggs was the leader in this field in New York City and later in the state of New York. It was in 1893 that he first enforced compulsory registration of tuberculosis, against the strong opposition of the medical profession of that day.

Early diagnosis was soon discovered to be all important for successful treatment and from the multitude of overrefined methods have emerged the history of exposure and of suspicious symptoms, together with the x-rays as the most important factors in early diagnosis, even superseding the value of physical signs.

In recent years mass examinations of groups of the population supposedly well have proved the great value of combined x-ray and tuberculin surveys for discovering early lesions especially in the young age groups.

Treatment of course was not neglected. The so-called hygienic dietetic regimen as best exemplified in sanatoriums has continued to be the fundamental basis of treatment, and here strict rest during the active stages with carefully regulated exercise during convalescence has proved to be a most important factor. Forced feeding and climate have become relatively less important.

The search for a specific cure has been relentlessly prosecuted both in the laboratory and in the clinical field. Serums and vaccines, special and often fantastic diets and chemotherapy applied by inhalations, by mouth and by intravenous routes have all failed, leaving behind a trail of disappointed hopes, of which the Friedman turtle serum fiasco is perhaps the most lamentable.

Calmette's BCG vaccine is a partial exception to the rule of failure, but even this has not yet proved to be of real value and at best is only a preventive and not a cure. In general it may be said that the recent success of chemotherapy in other fields has stimulated hopes for something similar in tuberculosis, but the time is not yet.

Chest surgery has advanced tremendously. Following on the general use of artificial pneumothorax, surgical methods to improve the results of the treatment of pulmonary tuberculosis have developed pneumolysis in the cutting of pleural adhesions, introduced by Jacobaeus in 1912, later phrenicectomy and especially thoracoplasty, first suggested by Brauer and Friedrich in 1909, and materially advanced to the position of a generally excepted procedure by the work of Sauerbruck and Wilms in 1913. At the present time about 40 per cent of all cases of pulmonary tuberculosis are being treated by some form of collapse therapy.

The combined action of all these measures of prevention and treatment, sanitary control, improvement of social and economic environment, education of the profession and the public, institutional segregation, earlier diagnosis and improved treatment has resulted in an astounding diminution in the incidence and the death rate from tuberculosis.

In 1900 the death rate from this disease in the United States was 202 per hundred thousand and in 1939 this had fallen to 47, or less than one fourth of the 1900 figure, and even more strikingly in New York City it has come down from 280 in 1900 to 50 in 1939, or less than one fifth of the previous total.

THE PRESENT SITUATION

The astonishing progress that has been made in the control of tuberculosis during the past forty years, as evidenced by the statistics just cited, has led to a widespread impression that the fight has been won and that the extermination of the disease is in sight. While this would appear more nearly a possibility than ever before in history, it is the part of wisdom that this be not taken for granted. Tuberculosis is still one of the major causes of death, especially in the younger age groups, and while it no longer holds the center of the stage in the drama of disease it nevertheless still plays a most important role. With the still very numerous foci of infection which exist, it would appear that under certain conditions the disease might easily begin to increase again. Certainly this might be expected if the precautions and methods learned should be relaxed because of satisfied complacency. In the present world crisis, for example, one may properly be concerned over the effect of postwar conditions. The experience of the last world war taught us how easily under conditions of privation, strain and undernourishment the tuberculosis morbidity and death rate can raise rapidly. Also with all of our accumulated knowledge there is still much that we lack which lends certain elements of uncertainty to the situation. As we possess no specific treatment, our methods must still be indirect with especial emphasis on prevention. This includes segregation of infectious cases, earlier diagnosis particularly through mass surveys and follow-up of contacts, with more adequate treatment of discovered cases before they become clinically active. The more widespread use of the x-rays is essential in this program.

It is to be noted that all of these methods are directed against the infection or against disease that it has already caused.

THE FACTOR OF RESISTANCE

There is another aspect of the problem sensed but still imperfectly understood. This is the defense mechanism in the human body against the infection. That this is a very real factor is evidenced by the facts now known that when exposed many escape infection and that of those known to be infected only a little over 1 per cent actually develop clinical disease. The wherefore of this is not definitely known but there are some intimations concerning it. It is well known for example that unfavorable environment predisposes to tuberculosis, which has long been recognized as a disease of the poor. Better opportunity for infection undoubtedly plays a role here, but that lowered resistance is also important seems evident. Natural or constitutional resistance is evidenced by the great variation in susceptibility in individuals, in families and in races. This applies to susceptibility to infection as well as to disease, as shown by the appreciable number of children who, though definitely exposed, fail to react to tuberculin. Natural resistance apparently can be enhanced through generations and possibly in some form it may be inherited.

Insufficient or unbalanced diets play their part. This has been attributed in the past to improper caloric food values, but the increase of knowledge concerning vitamins indicates that they may soon be recognized to be of at least as great importance. At present, however, we lack any precise knowledge of the particular vitamins which may influence resistance to chronic infections such as tuberculosis.

There is overwhelming evidence that a tuberculous infection successfully met changes the reaction of the body to subsequent infections and that this change means increased resistance. Such acquired resistance is only relative and may be overcome by large doses of infection or may be lowered by adverse environmental conditions. This resistance, acquired through many years or generations of exposure to repeated small infections, modifies the character of the disease and diminishes its prevalence.

What will be the epidemiologic consequences when an ever increasing proportion of uninfected persons as seen especially in rural areas are exposed to infection in later life under urban surroundings is still an open question. In other words, is it better to face the vicissitudes of life with a positive or a negative tuberculin reaction? Opinions differ, but the present trend in our campaign against exposure to disease is certainly tending to create a predominantly tuberculin negative population and at the same time the disease itself is diminishing. Theoretically, however, one cannot help but share the apprehension expressed by Bushnell many years ago that under certain favorable conditions this might conceivably lay the foundation for the return of tuberculosis as an acute epidemic disease. What is much needed is some criterion, not yet available, which might afford a basis for discrimination between good and bad risks under undue exposure to infection.

To those who believe in the great protective value of small doses of infection, a system of controlled vaccination appeals as the most satisfactory answer. Many animal and clinical experiments have been made in this field, of which Calmette's BCG is the outstanding example; but neither this preparation nor other experiments have as yet been proved to be of widespread usefulness.

The discussion of this problem has assumed considerable recent importance with regard to the hazards of tuberculosis to the medical and nursing professions, but practically it would appear that this danger has been greatly exaggerated. In the meantime for better or for worse we are rapidly increasing the proportion of "virgin soil" for tuberculosis among our general population.

CHEMICAL POSSIBILITIES

In recent years there has been a shift of research activity from the immunologic field to that of chemistry. The biologic characteristics of the tubercle bacillus are quite different from those of the streptococcus and the pneumococcus and among them apparently is an increased resistance to the destructive or inhibitive action of chemical substances introduced into the living body. The challenge in the direction of chemotherapy has, however, a great appeal and hopes for the future are not without a reasonable basis.

This necessarily cursory review of the story of tuberculosis reveals grounds for great satisfaction. Made possible by scientific research, guided by medical skill and strengthened by the social and economic forces released by a widespread diffusion of knowledge to the public, the struggle to overcome the "Great White Plague" has attained notable successes.

As already indicated, there still remains much to be done. What part is to be played by the medical profession in what we hope may be the concluding acts of the drama?

PRESENT MEDICAL RESPONSIBILITIES

Earlier Diagnosis.—X-ray examination is the cornerstone. The cases of pulmonary disease which may be considered really early can be discovered only by this means. When definite physical signs are present, the disease is usually already advanced. The history of suggestive symptoms is the indication for a prompt x-ray examination. Surveys by combined x-ray and tuberculin examinations for groups of apparently healthy people should have the active support and cooperation of physicians, but as individuals their chief responsibility is to concentrate especial attention in the most likely direction; this means on certain races, on certain economic groups and, for all classes, on the contacts with known cases.

The Better Practice of Preventive Medicine.—This includes not only the activities just enumerated but also a consistent effort to build up general health so that any later infection can be the better resisted. In this age of preventive medicine it is to be feared that many physicians still neglect its practice in favor of attention to the more insistent demands and the greater medical interest of frank cases of disease.

Cooperation with Public Health Authorities.—These authorities have the direct responsibility for the control of infectious diseases. They must work largely through physicians. If we as physicians assumed a greater individual responsibility to act as self constituted health officers for those patients under our care, the combined effect of private and public effort might well be irresistible.

Provision for Prompt and Adequate Treatment.—Strict bed rest is the most essential factor in the treatment of cases of active disease. In the really early cases the results are prompt and remarkable. Bed rest is applicable not only to cases in which there is fever but also to many afebrile cases in which other manifestations of activity are present. Change of climate, so long advocated, is definitely subordinate in importance to rest and in many active cases the journey involved in changing climate is absolutely contraindicated. Later, during the convalescent stage, a change to a more favorable climatic environment, especially for city cases, is of real value but should always be combined with proper medical supervision.

The proper regimen of a rest cure is always difficult in the home and often is impossible. Unless the home conditions can be made right or if the physician in charge is not experienced and interested in the numerous small but essential details involved, institutional care in hospital or sanatorium is necessary. Moreover, the educational and training value of the sanatorium regimen is very great not only at the time but also later when the patient goes out to face the problems of the return to normal life.

The various forms of collapse therapy have great value in properly selected cases. That so large a proportion of all cases, about 40 per cent, are now treated by these methods is, however, a reflection on the efficacy of our early diagnosis and treatment, for these cases are already advanced in the disease. Nevertheless, collapse therapy saves many lives otherwise doomed and, while it still presents many difficulties and problems, it represents the greatest major advance in the treatment of pulmonary tuberculosis of our generation.

Incidentally it has revived a surgical interest in tuberculosis which is valuable for the proper understanding and treatment of the nonpulmonary forms of the disease as well.

The vital importance of time must be emphasized in all forms of treatment as well as in diagnosis. In the latter the interval should be short between incidence and diagnosis; in the former it should be long, far longer than is frequently appreciated. Many an apparent cure has been ruined by a premature return to normal life.

All patients, however well they may appear, require a careful follow-up with periodic medical supervision for several years, which is essential if disappointing relapses are to be avoided.

While we as physicians are carrying out these generally accepted principles of treatment we should be receptive to the possibilities of a better and more specific form of treatment. Cautiousness in accepting any such cures is warranted by numerous bitter experiences and by our realization of the peculiar difficulties of the problem; nevertheless, both the hope and the possibility exist and when they are realized the wise physician will be the most eager to give the method a fair trial and also be the best judge of its efficacy.

Thus I bring to a conclusion this brief survey of our progress in the knowledge and measurable conquest of tuberculosis.

To physicians the story may well bring satisfaction in the achievements of the past but it also presents a challenge for the future. Scientists have pointed and will continue to point the way. Sanitarians and sociologists will largely apply the principles established. But on physicians has always rested the responsibility for meeting the actual problems at first hand and it is on their skill in diagnosis and treatment that continued success largely depends. It is my hope that the history of the way that we have come will throw some sidelights on our present knowledge and also point the way for future progress.

The problems of chronic illness may not be as dramatic as the sudden crises of acute disease, but from their very duration they more profoundly affect individual, family and community welfare.

Tuberculosis is still one of the most prevalent and important of these diseases. The physician who finds it worth his while to study it carefully will realize that, while there is still much that is not known, his effort to acquire and apply present knowledge will find him closely in touch with many other diseases and he will be led to study not only the lungs but also practically every organ of the body. He will meet personal and family problems which demand a human and psychologic approach. He will be brought to a realization of the importance of social and environmental conditions, the study of which will greatly broaden his horizon. Lastly he will appreciate that tuberculosis is a community problem which in importance even outweighs the interests of the individual and of the family.

Thus tuberculosis demands much of the physician. It is a challenge to our best effort. The degree to which we meet this challenge is a measure of our achievement as physicians and as citizens and will determine our ability to continue to play the leading role in this great drama.

133 East Sixty-Fourth Street.

Council on Industrial Health

MEDICAL SERVICE IN INDUSTRY

THE COUNCIL ON INDUSTRIAL HEALTH HAS APPROVED THIS ARTICLE AS ONE OF A SERIES ON MEDICAL SERVICE IN INDUSTRY WHICH WILL APPEAR FROM TIME TO TIME IN THE JOURNAL.

C. M. PETERSON, Secretary.

THE PLACE OF MEDICINE IN INDUSTRY

Industry's earliest medical need was for competent surgical treatment of injuries actually or likely to become compensable. For most employers this obligation remains the most important and often the only motive for providing medical service. Consequently this relationship is the sole point of contact with industry and industrial health methods for most physicians. Many factors tend constantly to modify this traditional concept of medicine's usefulness to industry. Society through occupational disease legislation demands that industry protect its employees not against accidents alone but against any harmful health experience associated with work as a cause. Experience in the safety movement turns the attention of employers to prevention as a cardinal principle for lowering the incidence of disability suffered by workmen whether through accident or disease, industrially induced or otherwise. This attitude is significant. It implies a gradual but steady reduction in the amount of required remedial service now provided by industrial medicine and surgery. In place of it the physician in industry will be asked to supply more and better preventive medicine, employing methods, equipment and special information now falling within the province of industrial hygiene.

VALUE TO THE EMPLOYER

As a rule an employer adopts a plant medical program containing functions beyond his legal obligation because he is convinced that such practices represent an improvement in the conduct of his business. Therefore a physician who is asked to supply these services should make it a point to comprehend the nature of the business with which he is to be associated and to understand how and why he can be of value to it. The essential purpose of any industry is the development of goods and services of such quality and price as to permit the widest possible distribution. Procedures calculated to accomplish this purpose are well defined by custom and long experience in many industries. Elsewhere they may be exceedingly complicated. Often extensive consumer research is necessary, as well as designing of an engineering nature. Markets must be developed, sustained and augmented by advertising and efficient distribution. Competition must be met, restrictive legislation conformed with, and provision made for taxation and finance. Facilities for the conduct of the business must be provided with proper equipment so arranged as to promote efficient production. Workmen must be employed and trained for specific jobs under competent supervision. Sound business management requires that trained manpower be conserved, kept in good physical condition and maintained steadily at gainful employment. It is through the successful accomplishment of this maintenance function that the physician in industry can make himself most helpful and not infrequently indispensable.

VALUE TO THE EMPLOYEE

The first objective of all industrial health activity is to promote the physical welfare of every worker. Certainly the interests of employer and employee are most nearly identical under an arrangement which tends to reduce all loss of working time because of sickness or injury. Individual workers stand to gain substantially in every instance in which the industrial medical service is competently and fairly administered. The advantage to the worker rests not solely on improved earning power through steadier employment but by proper placement in work fitted to his physical and temperamental makeup.

SCOPE OF INDUSTRIAL HEALTH

These values, which have been assigned by employer and employee alike, are responsible for the growth of interest in industrial health and for increasing demands on physicians to supply medical services to industry. This interest has been

productive of much good as well as of some misdirection and abuse. The medical profession has as a result developed a point of view which has the intent of defining the proper scope of industrial medical activity and of unqualifiedly condemning conditions which make it impossible to maintain adequate standards of medical performance.

In keeping with this broad opinion, the Council on Industrial Health believes that a properly administered industrial health program should:

1. Prevent disease or injury in industry by the establishment of proper control over industrial environment.
2. Promote restoration to health and earning capacity as promptly as possible after industrial injury or disease.
3. Conserve the health of workmen through physical supervision and education.

These are expressions concerning scope and not of specific functions. On the acceptance of these principles rests the justification for the development of industrial health as a special field of medical interest distinct from private practice and through which at the same time the aims of industrial and private practice are reconciled.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

PLASMATIC THERAPY INSTRUMENT NOT ACCEPTABLE

Manufacturer: Physical Medicine Instrument Company, Architects Building, Indianapolis.

At times, in order to fulfil its assumed obligations to the medical profession and to the public, the Council may consider itself called on to investigate and prepare reports on devices which have not been submitted, if such reports, in the opinion of the Council, are important to public health and welfare. The advertising and promotional matter distributed by the Physical Medicine Instrument Company have been inspected, and this report is based on them.

In the advertising used to promote the so-called Plasmatic-Therapy Instrument, F. B. Knyvett is designated as "Creator and developer of Plasmatic-Therapy." As part of the promotional matter Mr. Knyvett distributes a reprint of an article entitled "Pasturizing the Blood (Pyretotherapy with Conductive Heat)" in which are reported cases in which the Plasmatic-Therapy Instrument was used. Elsewhere in the advertising Knyvett writes that every case reported in the article was personally treated by him under the direction of a physician.

The Plasmatic-Therapy Instrument is described in the article as ". . . an apparatus which will introduce heat into the circulating blood without altering the balance of temperature that is normally maintained by the healthy body, and that will accelerate and control the pulse rate to within five beats per minute. . . . The Plasmatic-Therapy apparatus directly heats the blood." It is stated that the apparatus should be very useful to the average clinician because it makes it possible for him ". . . to administer pyretotherapy, which appears to be in some respects just as effective as that attained by the production of artificial fever or hyperpyrexia" most conveniently in his office. In this manner, the article explains, it is possible to obtain the benefits of fever therapy with none of the attendant disadvantages such as hospitalizing the patient or employing specially trained technicians, and it is possible to do this with an instrument much less costly than the apparatus used in fever therapy. The treatment is said to involve practically no discomfort to the patient, and shortly after the treatment is completed it is possible for him ". . . to safely dress and go about his business." The technic for "plasmatic" therapy treatment is said to be as follows:

"In basic outline, the plasmatic therapy treatment consists of surrounding the patient with two special long, narrow, heating units, each of which extends from the axilla, under the sole of the foot, and up the inside of the leg and thigh to the groin, where the two are connected. He is then enveloped in a sheet, a blanket or two, and a special rubber blanket. None of these coverings is wrapped so tightly as to constrict any part of the body enough to cause discomfort. The current, coming through an ingeniously constructed adjusting, timing, and regulating cabinet, is then turned on, and will be automatically turned off at the end of a predetermined period—from 30 to 60 minutes or more, as desired. Meantime the patient's pulse and temperature may be taken and recorded about every 10 minutes. Sweat should be wiped from the face as it collects, and water given through a drinking tube, as and if desired by the patient. This very simple attention which requires no special technical training, is all that is necessary unless definite discomfort should develop. . . ."

Ten cases are then reported in which this therapy was used. It is claimed that most of the patients had been previously treated by conventional or established methods which had failed to result in any improvement in the patient's condition. A series of plasmatic therapy treatments are said to have produced remarkable results in every case. In the case of a complete recovery from the effects of an attack of poliomyelitis, it is stated, "This case was investigated by representatives of the Press, and reported in the metropolitan newspapers."

The Council has often expressed the opinion that the administration of physical therapy and the use of physical therapy apparatus should be in the hands of trained individuals. To direct treatment intelligently it is imperative that the individual administrating the treatment understand the technic so that he may avoid the dangers that may result from ignorance. Since the article advises that a person with no training is competent to administer the treatment, it leads the Council to believe that the exaggerated claims made for the instrument may not have been substantiated by careful clinical examination.

To promote the sale of the Plasmatic-Therapy Instrument a communication signed by F. B. Knyvett is addressed to physicians and contains this opening sentence: "Dear Doctor; Would you like to add $600.00 a week to your income?" The "Earning Possibilities" of the Plasmatic-Therapy Instrument are then explained in detail and actual instances of physicians' earnings from the device are cited. For example, "A physician with offices in 57th Street, New York City, $1800.00 in the first 3 weeks. . . . A town over 1,000,000; this physician never previously had even a lamp in his offices. From November 4th to November 21st, $1265.00 in Cash Fees."

The question "Is A Special Technician Necessary For Such Work?" which is used as a heading in the letter is answered with these statements: "The answer is NO. Any office assistant can be taught in five minutes how to operate the instrument. Most physicians have found this an ideal way to make use of an otherwise *idle office assistant*—who previously only answered the phone during the Doctor's morning at the Hospital. Any such assistant can give from eight to ten treatments a day. After the first examination and authority for treatment, it is not necessary for the physician to be present at the Sessions."

In the section headed "What Are the Usual Fees For Treatment?" the physician is given this advice: "The most satisfactory manner in which to charge patients has been found to make a charge for a series of treatments—not so much for each individual treatment. The usual fee is $75.00 for a series of eight treatments. A large number of your cases will be remitted in this number of treatments. In chronic conditions, such as multiple-sclerosis, post encephelitis, locomotor-ataxia, osteo-arthritis, diabetes, endarteris-obliterans, etc., you cannot hope to bring a patient to recovery in any such series. In such cases, the patients are charged $50.00 for the second, and all other series, of 8 treatments each. Many physicians have received the surprise of their life, when a patient, suffering from a chronic condition, who is owing large sums for previous treatment, will go out and borrow the money for plasmatic-therapy treatment."

In another section of the promotional letter it is stated "We provide with the instrument a 100-page detailed instruction book covering the method of treatment, conditions suitable for treatment, attention to the patient during treatment and all other necessary data. In addition, we offer you proved suggestions on how to get new patients in an ethical and legitimate manner together with suggestions on what fees to charge, and how to collect them." This statement also is made: "We have had a

number of individuals from California to Maine, write us asking where they could obtain plasmatic-therapy treatment; the result of their reading an article on what had been accomplished by plasmatic-therapy, which they perused in a Journal in their own Physician's waiting room!"

The use of promotional material in which financial gain to the physician is stressed is highly objectionable. The implication is made in a promotional letter that the Plasmatic-Therapy Instrument has been submitted to and accepted by the American Medical Association. This implication is completely erroneous.

The ThermB, manufactured by the Op-Al Electric and Manufacturing Company, Indianapolis, a device also promoted by Mr. Knyvett, was submitted to the Council on Physical Therapy in 1934. The unit was an elaborate device for the heating of various body orifices and consisted of a chromium-plated steel cabinet containing diversified controls and regulators, and a number of varieties and shapes of applicators. The device was investigated in the urology and physical therapy departments of a clinic acceptable to the Council. A report was sent to the firm, Sept. 16, 1935, stating that "Because of the unfavorable clinical report, and because of the failure of the firm to submit acceptable advertising matter, the Council on Physical Therapy voted not to include the ThermB apparatus in its list of accepted apparatus." The report was not published in THE JOURNAL because, according to information received from the firm, the unit was no longer being manufactured.

A nine page advertising booklet entitled "The Blood is the Life" (a Biblical quotation), copyrighted by F. B. Knyvett, is said to explain the theory behind "Plasmatic-Therapy." Four pages of the booklet are used to inform the reader that blood is the vital fluid of life and that the plasma is an important part of the blood. On page 7 this statement is made: "If Pasteur was able to destroy all harmful bacteria in milk, wine, and other foods, by the action of controlled heat, it would certainly be within the bonds of possibility that we can do the same thing in the living blood!" Thus is Plasmatic-Therapy said to be a method of ". . . introducing heat DIRECTLY into the blood stream . . . !" or of "Pasteurizing the Blood!"

It is the opinion of the Council that insufficient critical evidence has been presented to substantiate the claims made for the instrument by the firm, and that the manner in which the apparatus is advertised and promoted is detrimental to the interests of both the public and the medical profession. The Council voted not to include the Plasmatic-Therapy Instrument on its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

LIVER AND STOMACH PREPARATIONS (See New and Nonofficial Remedies, 1940, p. 320)

POWDERS FOR ORAL ADMINISTRATION

(See New and Nonofficial Remedies, 1940, p. 323)

LIVER EXTRACT-ABBOTT.—A dried, powdered, nitrogenous, fat-free, water-soluble extract, prepared from fresh mammalian livers. The daily oral dose of approximately 25 Gm. (fifty capsules) has been found to produce the standard reticulocyte response defined as 1 U. S. P. unit (oral) when assayed in cases of pernicious anemia as required by the Council.

Actions and Uses.—Liver extract-Abbott is used in the treatment of pernicious anemia. See the general article Liver and Stomach Preparations, New and Nonofficial Remedies, 1940, p. 320.

Dosage.—Initial dose fifty capsules (approximately 25 Gm.) daily until examination shows a satisfactory blood cell count. The dosage is then kept at a level which will maintain remission.

Distributed by Abbott Laboratories, North Chicago, Ill. No U. S. patent or trademark.

Fresh edible liver is extracted with water at 170 F. for thirty minutes and filtered. The filtrate is concentrated in vacuo and then dried in vacuo. The dried material is powdered and filled into capsules. Each capsule contains the extract from 10 Gm. of fresh liver.

SOLUTION FOR PARENTERAL ADMINISTRATION

(See New and Nonofficial Remedies, 1940, p. 327)

LIVER EXTRACT (INJECTABLE) U. S. P.-ABBOTT, 5 UNITS PER CC.—A sterile aqueous solution of liver preserved with 0.5 per cent of phenol. The daily parenteral administration of 0.2 cc. has been found to produce the standard reticulocyte response defined as 1 U. S. P. unit (injectable) when assayed in cases of pernicious anemia as required by the Council.

Actions and Uses.—Injectable liver extract U. S. P.-Abbott is used for intramuscular injection in the treatment of pernicious anemia. See the general article Liver and Stomach Preparations, New and Nonofficial Remedies, 1940, p. 320.

Dosage.—Daily intramuscular injections of from 0.5 to 1 cc. may be given until the reticulocyte peak has been reached. The dosage is then kept at a level which will maintain remission.

Distributed by Abbott Laboratories, North Chicago, Ill. No U. S. patent or trademark.

Injectable Liver Extract, U. S. P.-Abbott (5 U. S. P. units per cc.), 10 cc. vial.

Injectable Liver Extract, U. S. P.-Abbott (5 U. S. P. units per cc.), 50 cc. vial.

Fresh edible liver is extracted with water at 170 F. for thirty minutes and filtered. The filtrate is concentrated in vacuo and extracted with 70 per cent alcohol; the alcoholic extracts concentrated in vacuo and precipitated with ammonium sulfate. The precipitate is further purified by alcoholic fractionation, the alcohol removed and the extract made up to volume so that each cubic centimeter contains the extract from 50 Gm. of fresh liver. Five tenths per cent phenol is used as a preservative.

SOLUTION FOR PARENTERAL ADMINISTRATION

(See New and Nonofficial Remedies, 1940, p. 327)

LIVER EXTRACT (INJECTABLE) U. S. P.-ABBOTT, 10 UNITS PER CC.—A sterile aqueous solution of liver preserved with 0.5 per cent of phenol. The daily parenteral administration of 0.1 cc. has been found to produce the standard reticulocyte response defined as 1 U. S. P. unit (injectable) when assayed in cases of pernicious anemia as required by the Council.

Actions and Uses.—Injectable liver extract U. S. P.-Abbott is used for intramuscular injection in the treatment of pernicious anemia. See the general article Liver and Stomach Preparations, New and Nonofficial Remedies, 1940, p. 320.

Dosage.—Daily intramuscular injections of from 0.25 to 0.5 cc. may be given until the reticulocyte peak has been reached. The dose is then kept at a level which will maintain remission.

Distributed by Abbott Laboratories, North Chicago, Ill. No U. S. patent or trademark.

Injectable Liver Extract, U. S. P.-Abbott (10 U. S. P. units per cc.), 5 cc. vial.

Injectable Liver Extract, U. S. P.-Abbott (10 U. S. P. units per cc.), 10 cc. vial.

Injectable Liver Extract, U. S. P.-Abbott (10 U. S. P. units per cc.), 30 cc. vial.

Fresh edible liver is extracted with water at 170 F. for thirty minutes and filtered. The filtrate is concentrated in vacuo and extracted with 70 per cent alcohol; the alcoholic extracts are concentrated in vacuo and precipitated with ammonium sulfate. The precipitate is further purified by alcoholic fractionation, the alcohol removed and the extract made up to volume so that each cubic centimeter contains the extract from 100 Gm. of fresh liver. Five tenths per cent phenol is used as a preservative.

SULFAPYRIDINE-SODIUM (See J. A. M. A. March 30, 1940, p. 1156).

Sulfapyridine Sodium Monohydrate-Calco.—A brand of sulfapyridine sodium-N. N. R.

Manufactured by Calco Chemical Division American Cyanamid Co., Bound Brook, N. J. U. S. patent applied for. No U. S. trademark.

SULFANILAMIDE (See New and Nonofficial Remedies, 1940, p. 489).

The following dosage form has been accepted:

Tablets Sulfanilamide, 5 grains.

Prepared by Flint, Eaton & Company, Decatur, Ill. No U. S. patent or trademark.

THIAMIN CHLORIDE (See New and Nonofficial Remedies, 1940, p. 528).

Thiamine Hydrochloride-Merrell.—A brand of thiamin chloride-N. N. R.

Manufactured by the William S. Merrell Company, Cincinnati.

Ampuls Solution Thiamine Hydrochloride 1.0 mg., 1 cc.
Ampuls Solution Thiamine Hydrochloride 6.0 mg., 1 cc.
Ampuls Solution Thiamine Hydrochloride 10.0 mg., 1 cc.
Thiamine Hydrochloride Tablets-Merrell, 1.0 mg.
Thiamine Hydrochloride Tablets-Merrell, 3.0 mg.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, OCTOBER 12, 1940

PHYSICIANS NEEDED FOR INDUCTION BOARDS

After registrants are accepted by local draft boards they will be sent for physical examination to medical induction boards. About one hundred such boards will be set up throughout the country, about half of them near army posts and stations. Each board will consist of three internists, one general surgeon, one orthopedic surgeon, two ophthalmologists, one otorhinolaryngologist, one neuropsychiatrist, one clinical pathologist and one dentist.

As explained by Colonel Love last week in The Journal (pages 1201-1202), the specialists to be assigned to such service will probably include civilian specialists as well as reserve officers, who will be on temporary duty. Civilian physicians will be on a per diem basis and will be used as long as their services are required. It has been proposed that they be paid at the base pay of major with allowances for travel and subsistence while on duty. Physicians preferred for this service are those who, on account either of age or of physical infirmities or because of reasons affecting their civil life, cannot go into military camp. It has been tentatively estimated that the time required for this service might approximate twenty to thirty days in the period between October 16 and February 1.

In order to aid the Army Medical Department in securing physicians for this service, the Committee on Medical Preparedness requests physicians who wish to volunteer to write at once to the Committee on Medical Preparedness, 535 North Dearborn Street, Chicago, marking the envelop "Induction Boards."

THE MEDICAL CONTROL OF MOBILIZATION

The medical problems presented by mobilization are already taxing the ingenuity of those responsible for the program now pending. The late Hans Zinsser,[1] basing his reasoning on experiences in the mobilization camps in 1917, pointed out that outbreaks of epidemics are almost inevitable when large numbers of men from all over the country are brought together in camps under circumstances which call for arduous physical and disciplinary training. Much control over the epidemic intestinal diseases such as typhoid and dysentery can be exerted by suitable preventive measures, but the situation with regard to respiratory diseases is more difficult. In such conditions as measles and mumps neither prevention nor treatment can be much better controlled than formerly. The importance of these diseases is emphasized by a citation of the figures: among the enlisted men who were serving in the United States during the year 1918 there were 102,950 cases of mumps.

Zinsser was convinced that the unimpeded flare-up of infectious diseases among young military units is stimulated by two factors: the too rapid bringing together of large numbers of susceptible young men with large numbers of carriers of the various respiratory organisms and the quite natural but too energetic efforts to force military training and the physical hardening process at a pace too strenuous for the relatively soft recruit. The evidence backing these beliefs is impressive and the countervailing measures suggested deserve practical trial. Such trial involves in part a change to a scheme of "gradual mobilization," which can be carried out in any one of a number of different ways. The assembly of large troop units can be developed in successive stages, beginning with small units and gradually joining these into larger units so that early medical supervision can be more carefully carried out. Military training or conditioning can be so graded that the necessary "hardening" is achieved without mass reduction of resistance to infection. The program adopted, however, should take into consideration the epidemiologic experiments of Greenwood and his co-workers,[2] some of whose conclusions, although carefully restricted to mice by them, deserve attention for their implications with regard to mobilization. Among them may be mentioned especially the conclusion concerning the general character of the epidemic process as revealed in herds of mice living in close and continuous contact and subject to the continuous or intermittent migration of susceptible individuals; thus it was shown that ectromelia, a virus disease of mice, under these circumstances will never normally die out.

Military mobilization presents a challenge and an opportunity. Available epidemiologic information such as that discussed must be utilized in planning each step of the assembly and care of the new recruits. The behavior of epidemic diseases under the different circumstances which develop must be carefully recorded and analyzed. Only by immediate concentration on these two objectives will it be possible to profit fully from the unique epidemiologic opportunity furnished by mobilization.

1. Zinsser, Hans: On the Medical Control of Mobilization, Mil. Surgeon **87**: 214 (Sept.) 1940.

2. Greenwood, Major; Hill, A. B.; Topley, W. W. C., and Wilson, J.: Experimental Epidemiology: Medical Research Council Special Report Series, No. 209, London, His Majesty's Stationery Office, 1936.

METHODS USED FOR IMPROVING ATHLETIC PERFORMANCE

The term "doping" was originally used to describe methods designed to increase the functional efficiency of athletes by means of highly active drugs. Now it is employed to describe any method of improving athletic performance temporarily either during training or in connection with competitive events. Bøje [1] has classified such substances into four groups: food preparations, oxygen, artificial sunlight and pharmaceutic substances.

Most of the food preparations, especially dextrose or sugar, which provide calories in a readily acceptable or otherwise suitable form are unobjectionable medically, Bøje feels. The evidence for the use of lecithin is not convincing and there seems to be no reason why it should be recommended for improving athletic performance. Similarly there is no experimental basis on which to recommend the use of yeast, although it does not appear to be deleterious. Conclusive evidence on the role of liver preparations in muscular work and its efficacy for increasing physical energy is also lacking.

Phosphates which have been employed can often cause a purely subjective feeling of freshness and zest for exercise which may amount to a condition of euphoria. Bøje concludes that phosphates taken in quantities exceeding the amounts found in a normally varied diet can probably increase the output of the organism. Although there is considerable loss of salts in heavy physical effort, this is probably insufficient to warrant administration of salts except in prolonged contests. Alkalis, usually in the form of sodium carbonate, have also been employed. Before deciding to administer them, attention should be given to the fact that the change produced by exertion in the p_H of the blood and its carbon dioxide tension influences among other things the regulation of respiration. Further, the administration of alkalis by mouth constitutes such a violent interference with the whole p_H regulatory system that it is as likely to be detrimental to the maximum physical output as the reverse. For a small group, such as aviators and mountaineers, ammonium chloride can be considered as an agent capable of increasing functional capacity. Other than for occasional slight local irritation, there can be no medical objection to its use.

The use of pure oxygen as a "dope" has been discussed from time to time. It may be granted that if it is administered immediately before the start of a contest, especially in the case of underwater swimming, it may exert some favorable effect. Nevertheless Bøje feels that most athletes and sports leaders have a fanciful and confused idea about the meaning of "oxygen priming" and that it is highly questionable whether the inhalation of oxygen is of any advantage in ordinary sports events.

Much has been said recently about the value of ultraviolet rays in connection with athletic training. Certainly if administered in suitable doses ultraviolet radiation should not produce any dangers, although athletes who are not used to ultraviolet rays should refrain from exposure immediately before taking part in competitions.

Pharmaceutic substances have been used in athletics based on their influence on the nervous system either as stimulants or as soothing agents. The toxic action of alcohol so overshadows its other effects that its role as a source of energy is of little athletic importance. Ether has been included by some as a "doping" agent but its use does not appear to assume any real importance in connection with sports. "Smelling salts," usually consisting of a solution of ammonia and of ammonium carbonate combined with ethereal oils, is popular in the prize ring and can be pronounced harmless.

Cocaine is one of the oldest known forms of "dope," although the extent to which it is now used by athletes is unknown. Leaving aside the question of whether or not it affects metabolism favorably, its influence on the central nervous system, which constitutes the motive for its use as a stimulant, cannot be questioned. Cocaine is effective in removing the sensation of fatigue and can in this manner undoubtedly raise the level of performance in the course of prolonged effort. This mechanism, however, is dangerous; it may have acute intoxicating effects when used in large doses. Its repeated use engenders addiction. Cocaine should never be used in connection with athletics.

Caffeine and other purine derivatives, although widely used as stimulants in connection with physical and mental effort, do not appear to have any established effects in connection with brief physical effort. Definite conclusions cannot be derived from the few available experiments on extended exercise. Furthermore, it is difficult to gage how far coffee, chocolate and cocoa given to athletes in normal therapeutic doses as a physical stimulant can endanger their health. It seems likely that any substance capable of stimulating the body to exertion beyond the normal limits of fatigue set by the body will prove injurious.

Amphetamine sulfate is much more capable than caffeine of eliminating the sensation of fatigue; the overwhelming evidence of its toxicity, together with the fact that it is not definitely established that performance is improved, indicates that this substance should not be used in connection with athletics. Moreover, the application of extra stimuli or a weakening of natural powers of resistance in organisms undergoing a severe strain must involve risks.

The group of drugs including valerian, bromides and barbituric acid derivatives can be included, but there seems to be no danger of abuse among athletes since every one of these substances has powerful fatigue-producing properties. Digitalis and glyceryl trinitrate

1. Bøje, Ove: Doping: A Study of the Means Employed to Raise the Level of Performance in Sport, Bull. Health Organ., League of Nations **8**: 439, 1939.

likewise can be readily eliminated both because of insufficient evidence of their "doping" properties and because of their toxic effects. Nikethamide and metrazol have been employed by athletes because of their stimulating influence on the circulation and the central nervous system, which produces a definite subjective feeling of freshness in the tired organism. There is, however, nothing to show that recovery is improved and there are deleterious effects, especially in the convulsive properties of both substances. The use of such products by athletes should be definitely avoided. Finally, although various endocrine products have been tried the evidence on this subject is so flimsy that their use should be avoided, since it may involve dangers the extent of which cannot be evaluated.

Medical advisers must naturally strictly forbid the use of any agent suspected in any manner of being deleterious or any substance which may cause the least direct danger of whipping up the organism to extreme exertion. Although there can be little objection to the use of nutrient agents, of vitamins and of oxygen, the medical adviser should also do everything he can to discourage the use of costly and ineffectual substances.

Current Comment

THE CONSERVATION OF MEDICAL RESOURCES

An uninterrupted supply of qualified doctors of medicine to meet the future demands of adequate national preparedness and the needs of the civilian population is vital to the future of our nation. The Committee on Medical Preparedness of the American Medical Association urged last July that preparation for the conscription of the man power of this country should include provision for the continuation of medical education of students in medical schools and of interns in approved institutions. The Selective Training and Service Act of 1940 does defer the conscription of students in schools but only until next July. Specific deferment is not provided for those who may be completing their medical training as interns or as residents. An amendment has now been proposed to the Selective Training and Service Act of 1940 by Senator Murray of Montana in the form of a bill, S. 4396, providing that "medical and dental students at recognized medical and dental schools, and interns and resident physicians, surgeons and dentists at recognized hospitals" shall be exempt from training and service but not from registration. Any such student, intern or resident, the bill continues, who is a member of a reserve component of the land or naval forces of the United States shall not be ordered or called to active duty or into active service in any such forces without his consent, except in time of war. Finally it is proposed that any person selected for training and service under the act (1) who has been awarded a degree of doctor of medicine or doctor of dental surgery by a recognized medical or dental school, (2) who holds a valid license to practice medicine or dentistry and is engaged in such practice at the time of his selection, and (3) whose physical and mental fitness for such service has been satisfactorily determined shall in lieu of induction for training in service be commissioned as an officer in the Medical Department Reserve, Officers' Reserve Corps, and ordered into active military service of the United States as provided in the joint resolution approved Aug. 27, 1940, by which the President was authorized to call into active service members of the National Guard and Reserve components of the Army. Senator Murray's bill was referred to the Senate Committee on Military Affairs. A companion bill, H. R. 10587, is pending in the House Committee on Military Affairs. Until and unless these measures become law interns, medical students and residents should provide for local selective service boards information and affidavits indicating their desire for exemption because of essential work for the public health.

THE SCIENTIFIC EXHIBIT

As the years have passed, the Scientific Exhibit of the American Medical Association, which began with a few demonstrations made by pathologists, has developed into a vast assemblage of the newest research in all the fields of medical science presented by those who are doing the work. The demonstration recently held in New York represented the very peak of what is accomplished for the graduate education of physicians by an exhibit of this kind. In the current issue of the *American Journal of Public Health* Dr. D. B. Armstrong and John Lentz publish a survey of health interests and present the following comment regarding the Scientific Exhibit in New York:

> The Scientific Exhibit, an annual feature of the conventions of the American Medical Association, was viewed by thousands of physicians and representatives of related professions during the recent meeting in New York City. No one who witnessed the 1940 array of exhibits could fail to be impressed by the fact that it constituted a remarkable demonstration of the amount and variety of research and of professional education that are being undertaken under all kinds of medical auspices today. The exhibit particularly reflected the serious and exhaustive inquiries into the mysteries of medicine that are being made by private practitioners and by voluntary groups of medical men. It emphasized the great effort to enhance precision and utility as regards diagnosis and treatment in the many fields of specialization. The keen study given the exhibits by the thousands of professional visitors was another most encouraging sign.
>
> Critics of medicine have classified it as a sordid trade or a moribund science—characterizations with which all would disagree who had the privilege of seeing the manifest growth, vitality and scientific integrity evidenced by the Scientific Exhibit at the 1940 and previous conventions of the American Medical Association. The threats of litigation and regimentation in medicine are unimportant and transient when measured against the long-time and far reaching significance of this demonstration of medicine's perpetual search for truth in its service to mankind.

On many occasions, physicians have said that a survey of this exhibit by those who are most vociferous in their attacks on modern organized medicine would serve to do much to put in their minds a wholesome respect for the dignity and the service of American medicine.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

CAUSES FOR REJECTION FOR ENTRANCE INTO THE REGULAR ARMY DUE TO PHYSICAL DEFECTS

GEORGE E. LEONE, M.D.
Captain, Medical Corps, U. S. Army; Medical Inspector for Recruiting, Second Corps Area
New York

In a preliminary statistical report on the causes for rejection due to physical defects of applicants for enlistment into the Regular Army of the United States some interesting observations were made. The report covered a three month period, June, July, August 1940, of applicants examined physically in the Southern New York District of the Second Corps Area, which includes New York City proper. These examinations were conducted by full time medical examiners under the direct supervision of Regular Army medical officers at 39 Whitehall Street, New York City. The applicants were for original enlistment into the Regular Army during an intensive recruiting campaign and the physical standards as set forth by the War Department, Army Regulations 40-105, were applicable. The age group included young men between the ages of 18 and 35, unmarried, citizens of the United States, having no record of conviction of a felony, and having the education or equivalent of the eighth grade. Many were high school and college graduates.

The total number of applicants covered by this report was 6,743, and of this total 2,195 were rejected for failure to meet the physical requirements. Thus more than 32.5 per cent, or nearly one third of all the applicants who presented themselves for physical examination, having had the other qualifications, were found physically unfit to become soldiers of the Regular Army.

What were the causes for these rejections? The major causes revealed by this report were failure to meet the requirements with regard to the following, in the order of their importance numerically:

1. Teeth.
2. Eyes.
3. Height and weight (stature).
4. Feet.
5. Ears.

Teeth.—Failure to meet the dental requirements stands out as the most important cause for rejection. Of the total number rejected during this period, that is, out of 2,195, there were 516 rejections due to teeth, more than 23 per cent of the total number rejected. It is difficult to convince young men that good sound teeth are necessary for healthy soldiers and more than one disappointed applicant who has been rejected because of poor teeth has exclaimed "What is the idea? Do we have to bite the enemy?" A minimum number of serviceable teeth have been set down as the requirements and it was amazing to find how many young men who have attended our public educational institutions failed to come up to these minimum requirements. It is well known that the condition of the teeth is a fairly reliable criterion on the general health and habits of young men. An indirect service was done for these young men who were rejected when the poor oral hygiene was called to their attention, and many expressed surprise and desire for corrective measures.

The requirements for teeth as set forth by Army Regulations are "a minimum of three serviceable natural masticating teeth above and three below opposing and three serviceable natural incisors above and three below opposing." Therefore the minimum requirements consist of a total of six masticating teeth and six incisor teeth. All these teeth must be so opposed as to serve the purpose of incision and mastication. Masticating teeth include molar and bicuspid teeth, incisors include incisor and cuspid teeth. Teeth which are involved with severe caries are not to be considered serviceable.

Eyes.—The next in importance as a major cause for rejection was the failure to meet the requirements in vision; 479 applicants, or 21 per cent of the total number rejected, were in this group. Most of these young men who could not see well enough to become soldiers did not wear glasses. Further classification of this particular group found most of them suffering from myopic astigmatism. Practicaly all of them had been driving motor vehicles and many could not be made to understand why they should be rejected, as they possessed operators' permits to drive.

Height and Weight (stature).—Fifteen per cent, or 308, were rejected because of the inability to meet the requirements for height and weight, the majority falling in the group that were underweight for their height. Experience has shown that great disproportion in the weight and height relation may mean lack of resistance and they usually are the first to break down physically when up against the rigors of military service. Many of those underweight showed signs of undernourishment and were potential candidates for tuberculosis.

Feet.—A total of 213, or little more than 10 per cent, were rejected because of poor feet. The results from functional tests for good feet were used as a criterion rather than anatomic conformation. Many feet that appeared flat anatomically showed good function when subjected to some strenuous tests. A considerable number of overlapping and hammer toes were found among those who were wearing ill fitting shoes.

Ears.—The fifth major cause for rejection was due to failure to meet the hearing and ear requirements. There were 202, or 10 per cent, in this group. The majority of those rejected in this group were found to be suffering from purulent otitis media in acute or chronic form in one or both ears associated with impaired hearing.

Other Causes.—The accompanying table shows other causes for rejection. No attempt has been made to find the reason for these figures.

The high number of rejections for teeth surprised us. When we compared figures with upstate New York, however, the same ratio held. The majority, perhaps 75 per cent, of the men rejected for dental defects had conditions that were remediable with proper dental treatment and improved oral hygiene. Many teeth, although present, had to be considered unserviceable because of extensive caries. Again, had many of the men rejected for eye defects been equipped with the proper correctable lenses they would have met the requirements.

The table may differ in some respects from the figures to be obtained when the Selective Service Law becomes operative. It must be remembered, however, that the applicants in the group covered by the present report were volunteers—young men who believed they were physically fit to fight for the defense of their country. It is obvious, for instance, that few young men who have the intelligence to become soldiers would voluntarily present themselves for service with the colors if they had active venereal disease. It is only when all the men in a certain age group are required to report for service that a higher percentage of this type of disease is found.

Rejections Due to Physical Defects, June, July and August 1940

Cause	June	July	August	Total for Three Months Period	
Teeth	147	182	187	516	
Eyes	145	161	173	479	
Height and weight	70	110	128	308	
Feet	37	58	118	213	
Ears	64	86	52	202	
Skeletal	13	34	30	77	
Genito-urinary	21	26	25	72	
Neuropsychiatric	21	25	21	67	
Allergy	12	20	20	52	
Heart	7	11	15	33	
Glandular	17	9	5	31	
Skin	12	6	8	26	
Respiratory	6	6	9	21	
Miscellaneous	8	13	38	59	
Total rejected	583	762	850	2,195	32.5%
Total accepted	1,374	1,551	1,623	4,548	
Total examined	1,957	2,313	2,473	6,743	

23% of total rejected due to teeth
21% of total rejected due to eyes
15% of total rejected due to height and weight
10% of total rejected due to feet
10% of total rejected due to ears

The reason for this report is to present in a preliminary way the major causes for the rejection of our youth from entrance into the Regular Army, especially with regard to the teeth, eyes and ears. It also gives our medical examiners a clue as to what to look for particularly in the examination of applicants. It is also hoped that some preventive and remediable measures may be instituted for the better preservation of the health of the youth of our nation. As a national defense measure this is of vital importance for the future.

Room 811, 39 Whitehall Street.

EVACUATION HOSPITAL ORGANIZED

In cooperation with the defense program of our country, an evacuation hospital has been organized among the staff of the University Hospital and of the faculty of the Ohio State University College of Medicine, comprising twenty-eight medical and two dental officers, with Dr. John W. Means in charge of the unit.

APPOINTMENT IN NAVY MEDICAL CORPS

The Surgeon General of the Navy, Rear Admiral Ross T. McIntire (M. C.), announces that the Medical Corps of the Navy is being increased in strength proportionate with the expanding Navy and the Marine Corps. Examinations for appointments as commissioned officers in the Medical Department of the Navy will be held Jan. 6-9, 1941.

Appointments are being made in the Medical Corps, United States Naval Reserve, of male citizens of the United States, graduates of class A medical schools, who are under 50 years of age and who meet the physical and professional requirements.

The examination to be held in January will be for appointment as assistant surgeon in the medical corps of the regular Navy, effective about two months from date of examination, and for acting assistant surgeon (intern), effective July 1, 1941. Requests for authorization to appear for these examinations should be submitted to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., in sufficient time to permit the authorization to reach the applicant prior to Dec. 30, 1940.

Applicants for appointments as assistant surgeon must be citizens of the United States between the ages of 21 and 31, must be graduates of class A medical schools and must have completed one year of intern training in a hospital accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Association.

Applicants for appointment as acting assistant surgeon (intern) are not required to submit evidence of previous intern training and are appointed for a period of eighteen months, during which time they serve as interns in the larger naval hospitals which are approved for intern training. After completion of one year of service, acting assistant surgeons are eligible for examination for appointment as assistant surgeons. Acting assistant surgeons and assistant surgeons receive the pay and allowances of a lieutenant (junior grade).

Service for medical officers is active professionally and attractive in the shore duty, sea and foreign shore station assignments. In the normal rotation of assignments every practicable consideration is given the officer's preference for the type of duty he desires. The Naval Medical School at Washington, D. C., offers a course of postgraduate instruction and instruction in those branches of medicine which apply particularly to the naval service. Under normal conditions newly appointed medical officers are assigned to this course on entry into the service or during their first few years of naval service.

Naval medical officers are encouraged to develop a specialty after they have completed their first cruise at sea. Shortly before completion of his sea duty, the Navy doctor may request special training in the Medical Department specialty in which he is interested. Such requests are acted on by a special board in the Bureau of Medicine and Surgery and, if approved, the Navy doctor is sent to a hospital for training and experience in that specialty for one year. On completion of this training, he is assigned to postgraduate instruction at one of the medical centers in the United States for a period up to one year, after which, as far as is practicable, he is retained in that type of duty. Some of the specialties in which qualifications may be obtained are surgery, medicine, otolaryngology, x-ray, laboratory,

pathology, public health, psychiatry, deep sea diving, aviation medicine (flight surgery), gas warfare and tropical medicine. Several officers have been trained in research particularly applying to problems arising in submarine and aviation activities.

The service affords excellent opportunities for professional advancement. Medical officers receive the same pay and allowances as other officers of the Navy in corresponding ranks and the equivalent amount of service.

A circular of information for applicants for appointment as medical officers of the Navy, containing full information regarding physical requirements, professional examinations, rates of pay and promotion and retirement data may be obtained by addressing the Bureau of Medicine and Surgery.

Applications for appointment in the Medical Corps of the United States Naval Reserve should be addressed to the commandant of the naval district in which the applicant resides. The addresses of the naval commandants may be obtained from the Bureau of Medicine and Surgery.

INSTRUCTION IN SOCIAL HYGIENE FOR NEW YORK NATIONAL GUARD

Lectures on social hygiene are to be presented in each of the armories where the National Guard will be on duty before being transferred to active camp life, through the cooperation of Dr. Lucius A. Salisbury, division surgeon of the New York State National Guard, and Dr. Claude C. Pierce, regional director for the U. S. Public Health Service in the New York area. In New York City, the bureau of social hygiene of the department of health will furnish to the armed forces facilities prepared during the past few years, including moving pictures, exhibits, posters and literature. There are also plans to take advantage of the formation of a home guard to offer modern education in social hygiene. Interested persons are invited to ask for complete information on the facilities available through the bureau of social hygiene, department of health, 125 Worth Street, New York, or from the U. S. Public Health Service, Sub-Treasury Building, Pine and Wall streets, New York. There is no charge.

COMBATING PROSTITUTION IN WISCONSIN ARMY CAMP

With the information that immoral interests, which have been known to follow armies in camp, have become motorized with the development of the automobile trailer, the Wisconsin State Board of Health became active in controlling prostitution about the big scale army maneuvers in that state during August.

State and federal agencies, including army officials, cooperated under special rules to protect the state from any concentration of vice involving the menace of venereal diseases. Under emergency rules, no parking of trailers was permitted without special permit in the encampment area, which covered about 1,000 square miles.

Law enforcement officials of six counties touching on the military area cooperated with the officials during the month, and about thirty state-local enforcement officials were deputized during the period.

Rules adopted prohibited the opening of new tourist camps, dance halls, road houses, food stands or carnivals in the area, the picking up of hitch hikers, and the operating of taxicabs without special permit outside of municipal boundaries in the area.

The board ruled that civilians coming into the military zone, reasonably suspected of having a venereal disease could be inspected or examined by proper medical authorities and, if found to be infected, were to be hospitalized, quarantined or excluded from the area; also that prostitutes should not be permitted in the military zone.

INDIANA PUBLISHES MILITARY MEDICINE NUMBER

The Indiana State Medical Association has devoted its journal for September to military medicine. On the cover appears a picture of Fort Benjamin Harrison with troops in the foreground and a photograph of a patient being removed from an ambulance. Included among the subjects covered in the original articles are "Rational Contribution to National Defense by the Medical Profession" by Elmer F. Straub, Indianapolis; "Early Treatment of Gunshot Wounds and Fractures," Dr. Hiram W. Orr, Lincoln, Neb.; "The Medical Service of the United States Army," Lieut. Col. Paul R. Hawley, Carlisle, Pa.; "The Problem of the Psychopath in Recruit Training of the U. S. Navy," Dr. Emory L. Dravo, Great Lakes; "The Medical Officer from Civil Life," Dr. Larue D. Carter, Indianapolis; "Gas," Elliott H. Parks, Indianapolis; "Aviation Medicine," Dr. Albert M. Mitchell, Terre Haute; "Medical Defense," Dr. Herman M. Baker, Evansville, and "Registration Required," Robinson Hitchcock, Indianapolis. Special articles include one on "Medical Preparedness."

PROGRAM OF THE WISCONSIN STAFF MEETING

The program of the staff meeting of the Wisconsin General Hospital, Madison, October 1, was given over to military preparedness. The following subjects were discussed by members of the medical corps of the Wisconsin National Guard: Col. William F. Lorenz, "The Physician and Selective Service"; Lieut. Col. William J. Bleckwenn, "Organization of the Medical Department of the Army," and Capt. Marc J. Musser, "Functions of the Medical Department of the Army." Captains Frederick J. Pohle, Anthony R. Curreri and Clayton P. Wangeman of the medical reserve corps discussed the "Medical Problems encountered in Recent Second Army Maneuvers."

RESERVE OFFICERS IN PHILADELPHIA

The official bulletin of the Philadelphia County Medical Society reports that there are about 600 physicians and dentists in the Philadelphia area who are members of the Medical Reserves. There are about seventy-one physicians in the Naval Reserve.

The statement pointed out that many units of the National Guard are not filled up to their required strength and that, as the personnel must be increased at once, more medical officers will be required.

ORGANIZATION SECTION

MEDICAL LEGISLATION

DISTRICT OF COLUMBIA

Changes in Status.—H. R. 8665 has been reported to the House, providing for the issuance of a license to practice chiropractic in the District of Columbia to Lou Davis. H. R. 9284 has passed the Senate, providing for the issuance of a license to practice the healing art in the District of Columbia to Dr. A. L. Ridings.

MEDICAL BILLS IN CONGRESS

Changes in Status.—The conference committee on H. R. 960, extending the classified civil service of the United States, has reached an agreement and has submitted to the House and Senate a report in which it is recommended that the Hatch amendment, paving the way for the appointment of graduates of unapproved medical schools to civil positions in government service, be eliminated. H. R. 8613 has been reported to the Senate, proposing that any person who served as a member of the Army Nurse Corps or of the Navy Nurse Corps during the World War and continuously thereafter until May 13, 1926, and who was, prior to June 20, 1930, separated from said corps by reason of physical disability incurred in line of duty, shall, on her application therefor, be entitled to be placed on the retired list of the Nurse Corps of which she was a member. H. R. 10278 has been reported to the House, proposing that in time of war or during an emergency declared by the President or by Congress the Secretary of War may, in his discretion, dispense with any part of the examination for promotion in the Regular Army of officers of the Medical, Dental and Veterinary Corps, except those relating to physical examination.

Bills Introduced.—S. 4396, introduced by Senator Murray, Montana, and H. R. 10587, introduced, by request, by Representative McCormack, Massachusetts, propose to amend the Selective Training and Service Act of 1940 so as to provide that medical and dental students at recognized medical and dental schools, and interns and resident physicians, surgeons and dentists at recognized hospitals, shall be exempt from training and service under the act, but not from registration, and that any such medical or dental student, intern or resident who is a member of a reserve component of the land or naval forces of the United States shall not be ordered or called to active duty or into active service in any such forces without his consent, except in time of war. The bills further provide that any man selected for training and service under the Selective Training and Service Act (1) who has been awarded a degree of doctor of medicine or doctor of dental surgery by a recognized medical or dental school, (2) who holds a valid license to practice medicine, surgery or dentistry in any state, territory or possession of the United States or the District of Columbia and is engaged in such practice at the time of his selection, and (3) whose physical and mental fitness for such training and service has been satisfactorily determined shall, in lieu of induction into the land or naval forces of the United States for such training and service, be commissioned as an officer in the Medical Department Reserve, Officers' Reserve Corps, and ordered into the active military service of the United States as provided in the joint resolution approved Aug. 27, 1940, by which the President was authorized to call into active service the National Guard and Reserve components of the Army. H. R. 10606, introduced by Representative Schwert, New York, proposes to enact a "National Preparedness Act of 1940 for Health Education, Physical Education and Recreation in Schools and School Camps." The provisions of the bill, if enacted, will be administered by the United States Commissioner of Education, who is to be authorized to apportion federal grants-in-aid to be made available to the states that develop programs embodying the requirements set forth in the bill, subject to the approval of the Commissioner of Education. A school program, the bill provides, shall include among other things a continuous school health service, not including medical and dental treatment, to determine at least annually the health status of each pupil, to aid in the protection of pupils against communicable diseases, to provide special adjustment and guidance for pupils in need of such services; health supervision to insure safe and sanitary school conditions and processes for healthful living; instruction for all pupils in health and safety, including among other related and essential topics, instruction in nutrition, dental hygiene, first aid, effects of narcotic drugs and alcohol, physical and mental hygiene, and the hygiene of home and family life and such services as will bring all pupils having correctible and remediable defects under the care and treatment of licensed practitioners "or the proper agencies."

WOMAN'S AUXILIARY

Pennsylvania

The auxiliary to the Lackawanna County Medical Society had its annual bridge-luncheon, July 1, at the Scranton Country Club. About 130 members and friends attended, including representatives of the auxiliary to the Lackawanna County dental and pharmaceutical societies. The auxiliary voted a contribution to the American Red Cross for war relief work.——About 100 members and guests of the auxiliary to the Lehigh County Medical Society were entertained at a garden party at the home of Dr. and Mrs. J. Edwin Minner of Egypt, July 9. The proceeds were devoted to the charity fund.

Utah

At the annual meeting of the auxiliary to the Utah State Medical Association, Ogden, August 29 to 31, the attendance was excellent. Presiding at all sessions was Mrs. J. J. Weight of Provo, the president. Dr. G. M. Fister, president of the Utah State Medical Association, gave an address of welcome, followed by an address by Dr. Henry Nelson of Ogden. The guest speaker for the Thursday luncheon was Mrs. V. E. Holcombe, president of the national auxiliary, who spoke in behalf of the *Bulletin*, the official organ of the auxiliary. The report of the annual national meeting was given by Mrs. Claude Shields. "The First Woman Physician of Utah" by Mrs. John Z. Broun and an address by Dr. Alton Oschner of New Orleans were given at the afternoon session. Later the guests were taken up to Ogden Canyon to the summer home of Mrs. Ezra Rich. A bridge-garden party was held at the home of Mrs. Leslie A. Smith. Friday morning, Dr. James C. Carr, professor of medicine at Northwestern University Medical School, Chicago, gave an interesting account of the life of Dr. Rudolph Virchow, father of modern pathology. At a luncheon, Utah County gave a clever skit "Fadesius in Foodesius," an original comedy on diets. Friday afternoon, Mrs. L. J. Paul of Salt Lake City presented a symposium on public relations, introducing Drs. John Sharp, J. R. Morrell and Ivan Thompson as guest speakers. Mrs. Leslie Merrill spoke on "Health Programs for High Schools." The national president's subject for the day was "Being a Doctor's Wife Is Both an Art and a Career." In the evening, the ladies joined the doctors at a pageant, "Fifty Years of Medicine in Utah County." On Saturday morning the "Do's and Don'ts of Vacationing" was presented by women from Salt Lake County.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Changes in Health Officers.—The newspapers report the following recent changes in health officers:

Dr. Robert Webster Crowell, Mullins, S. C., appointed in Chilton County, succeeding Dr. Samuel D. Sturkie, Clanton, who resigned to join the Virginia State Department of Health with headquarters in Charlottesville.

Dr. Arthur M. Shelamer, Athens, in temporary charge of the Limestone County health unit, succeeding Dr. Frank M. Hall, Athens, who resigned for a year's study at Johns Hopkins School of Hygiene and Public Health.

Dr. Julian W. Davis, O'Donnell, Texas, in charge of Henry County, succeeding Dr. George E. Maddison, who resigned to offer his services to the Canadian army.

Dr. Thomas T. Box, health officer of Washington County with headquarters at Chatom, in charge of Choctaw County with offices in Butler, succeeding Dr. David B. Snelling who went to Greene County.

Dr. William A. Blake, formerly of Blountville, Tenn., succeeded Dr. Box in Washington County.

Dr. Isee L. Connell, Birmingham, appointed in Cleburne County, succeeding Dr. Frank R. Wood, Heflin, whose term expired.

Dr. Eldridge T. Norman, health officer of Marengo County, appointed in charge of Hale County, with headquarters in Greensboro, succeeding Dr. Benjamin M. Drake, who recently resigned.

Dr. Marion L. Shaddix, Phenix City, health officer in Russell County, has been transferred to Clay County in a similar capacity.

ARKANSAS

Ninth Course of Graduate Instruction.—The committee on postgraduate instruction, Arkansas Medical Society, is offering its ninth course of graduate instruction, October 16-17, in cooperation with the University of Arkansas School of Medicine, Little Rock. Guest speakers will be Drs. John M. T. Finney Jr., Baltimore, and Hubert M. Parker, Kansas City, Mo. Dr. Finney will discuss "Appendicitis" and "Diverticula of the Small Intestine" and Dr. Parker, "Calcium Therapy, Indications and Contraindications" and "Management of Symptoms in Patients Who Have Had Several Laparotomies." Other speakers will include:

Dr. Grady W. Reagan, Little Rock, Newer Methods in the Diagnosis and Treatment of Pyelonephritis.
Dr. Clyde D. Rodgers, Little Rock, Sterility.
Dr. Barton A. Rhinehart, Little Rock, The Essentials of Normal Nutrition.
Dr. Charles C. Reed Jr., Little Rock, Intravenous Anesthesia with Pentothal Sodium.
Dr. Byron A. Bennett, Little Rock, The Therapeutic Indications for the Use of Hormonal Preparations in Gynecology.
Dr. John N. Compton, Little Rock, The Good and the Bad About Sulfanilamide and Related Drugs.

Refresher courses will be offered concurrently with the postgraduate course. They are intended to be a comprehensive review emphasizing fundamental anatomic, physiologic, pathologic and clinical aspects of the subjects presented. They will be informal, making use of patients and clinical case reports.

CALIFORNIA

Physicians' Bowling Team.—A movement is under way to form a physicians' bowling team, consisting in the beginning of teams made up by members of the Los Angeles Medical Association. The object is, however, to develop a statewide league and a national organization patterned after the American Medical Golfing Association, with annual tournaments in the city in which the American Medical Association has its annual session. Information may be obtained from Dr. Lewis W. Bremerman, 1709 West Eighth Street, Los Angeles.

Society News.—The Los Angeles Surgical Society was addressed, October 11, by Drs. Harold L. Thompson on "Traumatic Lesions of the Bowel"; E. Eric Larson, "Gastric Resection," and Vernon P. Thompson, "The Mechanical Problems of Femoral Neck Fractures." All are from Los Angeles. ——Dr. George P. Landegger, Los Angeles, will discuss "History of Art" before the Los Angeles Physicians' Art Society, October 15, and Mr. Leslie G. Walker, "Painting with Light." ——The San Francisco County Medical Society devoted its meeting, October 8, to a discussion on "Can We Get Adequate Nursing Care?" The speakers were Dr. Anthony J. J. Rourke and Marjorie Hart, R.N.; Sally Heitman, R.N., and Helen Reynolds, R.N.

COLORADO

State Medical Election.—Dr. Guy C. Cary, Grand Junction, was chosen president-elect of the Colorado State Medical Society at its annual meeting, September 14, and Dr. William H. Halley, Denver, was inducted into the presidency. Dr. John S. Bouslog, Denver, is the constitutional secretary. The next annual session will be held in Estes Park, the date to be decided later.

DELAWARE

Society News.—The New Castle County Medical Society was addressed in Wilmington, September 17, by Louis Gershenfeld, Pharm.M., Philadelphia, on "Serums, Vaccines and Related Products," and Dr. Joseph R. Beck, Dover, "Statistics on Diphtheria Immunization in Delaware."

State Medical Election.—Dr. Emil R. Mayerberg, Wilmington, was elected president of the Medical Society of Delaware at its annual meeting in September, to succeed Dr. Bruce Barnes, Seaford. He will take office in January. Dr. Charles L. Munson, Wilmington, is the secretary. The next annual session will be held in Wilmington, the date to be decided later.

DISTRICT OF COLUMBIA

Personal.—Col. Norman L. McDiarmid, medical corps, U. S. Army, has been appointed superintendent of Columbia Hospital for Women, Washington, to succeed the late Col. Percy M. Ashburn, who died August 20. Colonel McDiarmid has been stationed in the headquarters of the fourth corps area, Atlanta.

Society News.—Dr. Max M. Strumia, Bryn Mawr, Pa., addressed a meeting of medical and dental officers of the U. S. Navy in Washington, October 7, on "The Preparation and Utilization of Blood Plasma in the Naval Service." —— The Medical Society of the District of Columbia was addressed in Washington, October 9, by Dr. Lauritz S. Ylvisaker, associate medical director, Prudential Insurance Company of America, and Mr. Pearce Shepherd, associate actuary of the Prudential, on "The Importance of Heart Disease." The society will be addressed, October 30, by Drs. Hugh H. Young, Baltimore, on "The Use of Radium in Tumors of the Bladder and Prostate" and Arthur C. Christie, Washington, "Diagnosis and Treatment of Cancer of the Pharynx."

GEORGIA

District Meeting.—The Fifth District Medical Society will meet in Atlanta, October 17. The speakers will be Drs. Robert B. Greenblatt, Augusta, on "The Vaginal Smear as a Guide to Estrogenic Therapy"; Robert C. Pendergrass, Americus, "Unusual Lesions of Gastrointestinal Tract" and Richard Torpin, Augusta, "Roentgen Pelvimetry." Dr. Job C. Patterson, Cuthbert, president of the state medical association, will also speak.

IDAHO

Director of Health Resigns.—Dr. Howard L. McMartin, Boise, has resigned as director of public health of Idaho and has accepted a position as director of health of Maricopa County, Ariz.

State Medical Election. — Dr. Paul M. Ellis, Wallace, was chosen president-elect of the Idaho State Medical Association at its annual session, September 13, and Dr. Abram M. Newton, Pocatello, was installed as president. Dr. Franklin B. Jeppesen, Boise, was elected secretary. The next annual meeting will be held in Sun Valley, June 18-21.

ILLINOIS

Hospital News.—The new $600,000 Lake County tuberculosis sanatorium was dedicated in Waukegan, August 18; Dr. Morris Fishbein, Editor of THE JOURNAL, Chicago, was the principal speaker, using for his subject "Campaign Against the White Plague."

Society News.—Dr. Millard F. Arbuckle, St. Louis, discussed "Diagnosis and Treatment of Lung Abscess" before the Jefferson-Hamilton County Medical Society in Mount Vernon, September 25.——Dr. Joseph E. Schaefer, Chicago, addressed the Macoupin County Medical Society in Carlinville, September 24, on "Lesions of the Mouth."——Dr. Arthur J. Fletcher, Danville, discussed poliomyelitis before the Saline County Medical Society in Eldorado, September 27.——A symposium on diseases of the biliary tract was presented before the Vermilion County Medical Society in Danville, October 3, by Drs. Rollo K. Packard, Percy E. Hopkins and Charles H. Phifer, Chicago. Dr. Edwin S. Hamilton, Kankakee, discussed "Organization of the Medical Profession for National Defense."——

Dr. Wendell W. Brown, Collinsville, addressed the Madison County Medical Society in Collinsville, October 4, on "Indications and Applications of X-Ray and Radium Therapy in Gynecology."——At a meeting of the Stephenson County Medical Society in Freeport, October 17, Dr. Charles J. Drueck, Chicago, will speak on "Cancer of the Rectum."——The Whiteside County Medical Society will be addressed in Sterling, November 7, by Dr. Clifford J. Barborka, Chicago, on "Management of Gallbladder Disease."——Dr. James E. Graham, Springfield, discussed "Varicose Veins" before the Adams County Medical Society in Springfield, September 9.

Chicago

New Hygiene Clinics. — Three free social hygiene clinics have been opened in Cook County through funds obtained under the National Venereal Disease Control Act. The clinics are in the Berwyn, Maywood and Robbins health centers. Additional clinics will be opened soon in Cicero, Harvey and Chicago Heights.

Alumni Reunion. — An informal reception and open house will be held, October 16, to honor three new deans of the Chicago colleges of the University of Illinois. They are Dr. Raymond B. Allen, executive dean of the Chicago colleges; Howard M. Marjerison, D.D.S., dean of the college of dentistry, and Earl R. Serles, Ph.D., dean of the college of pharmacy. An invitation is extended to all alumni of the University of Illinois.

INDIANA

Society News.—The Tippecanoe County Medical Society was addressed in Lafayette, September 10, by Dr. Harold S. Hulbert, Chicago, on "Behavior Problems, What Can We Do?"——Dr. Edwin L. Libbert, Lawrenceburg, addressed the Dearborn-Ohio County Medical Society in Lawrenceburg, June 27, on "Medical Physiotherapy."——The Indianapolis Medical Society will devote its meeting, October 15, to a symposium on tuberculosis with Drs. Charles J. McIntyre, Chester A. Stayton and Frank L. Jennings as the speakers. The society will be addressed, October 22, by Drs. Willis D. Gatch on "Surgical Aphorisms"; J. Neill Garber, "Clinical and Pathologic Aspects of Volkmann's Contractures" and James S. Browning, "Tests of Cardiac Function."

MARYLAND

Semiannual Meeting of State Society.—The Medical and Chirurgical Faculty of the State of Maryland held its semiannual meeting in Annapolis, October 9. Dr. Robert S. G. Welch, Annapolis, vice president, Anne Arundel County Medical Society, gave the address of welcome. Drs. William F. Rienhoff Jr., Baltimore, and William D. Stroud, Philadelphia, discussed "The Jaundiced Patient" and "Cardiology," respectively. Dr. Edward P. Thomas, Frederick, president, Medical and Chirurgical Faculty, also spoke.

Personal.—Dr. Louis B. Flexner, associate in anatomy at Johns Hopkins University School of Medicine, Baltimore, has been appointed research associate in the department of embryology of the Carnegie Institution of Washington in Baltimore, according to *Science*. He will continue to investigate chemical interchanges in mammalian development, making use of artificially radioactive substances in cooperation with the department of terrestrial magnetism of the Carnegie Institution. Herbert A. Pohl, Ph.D., has been appointed research assistant in the department of embryology and Dr. Alfred A. Gellhorn a research fellow. Dr. Ines Lopez Columbo de Allende, during the past year visiting fellow of the Argentine Association for the Advancement of Science at the University of Rochester, has been appointed to a Rockefeller traveling fellowship and will spend the year 1940-1941 in the department of embryology of the Carnegie Institution.

MASSACHUSETTS

Personal.—Dr. Edwin B. Astwood, associate in obstetrics at the Johns Hopkins University School of Medicine, Baltimore, has been appointed assistant professor of pharmacotherapy at Harvard Medical School, Boston. He will also be a member of the staff of Peter Bent Brigham Hospital.

New Publication on Mental Hygiene.—The Massachusetts Society for Mental Hygiene announces that it has started the publication of a quarterly magazine *"The Mental Health Sentinel,"* the first issue of which will appear this month. The editorial staff consists of Dr. Henry B. Elkind, Boston, editor; Miss Bernice M. Henderson, associate editor; Dr. Douglas A. Thom, Boston, president of the society; Dr. Clarence A. Bonner, Danvers, and Dr. Harry C. Solomon, Boston.

MICHIGAN

Prizes for Medical Papers.—The Foster Welfare Foundation of Grand Rapids, founded under the will of the late Clara J. Foster of Newaygo, announces the offering of prizes for medical papers on the following terms: Three $100 cash prizes will be awarded, one each for the hospital staff of Blodgett Memorial Hospital, Butterworth Hospital and St. Mary's Hospital, respectively, all of Grand Rapids. The prize will be awarded to the author or authors of the best medical paper written by a member of the staff of the hospital, provided the staff of such hospital produces at least five medical papers, including the winning paper, which have been accepted for publication by either a national or a state medical journal during the year commencing May 1, 1940, and ending May 1, 1941. Each paper submitted may be written by one or more persons and, in the event that it is written by more than one, the award will be divided proportionately among the authors. Besides the three $100 prizes mentioned, there will be an additional grand prize of $100 to be awarded to the writer or writers of the best medical paper produced during said year, and accepted for publication, by members of the staffs of the three hospitals. This prize may be won even though the author's hospital staff has not produced five such medical papers during the year or may be won by the same author or authors and with respect to the same paper which is awarded one of the hospital staff prizes if such hospital staff qualifies by producing five papers. Typewritten copies of each of the papers to be submitted for prizes must be in the hands of a medical committee not later than May 1, 1941, including the papers, if any, not submitted for prizes but which are necessary in order to qualify a particular hospital staff as having written five medical papers accepted for publication during the year. The local medical committee will comprise three doctors, one from each hospital staff, which shall be appointed by the president of the Kent County Medical Society, subject to the approval of the board of trustees of the Foster Welfare Foundation. The duty of this committee will be to administer the work of collecting the papers and arranging the details of awarding the prizes. The committee, however, will not act as judges, and its members will be eligible to compete for the prizes. The judges to pass on the papers will be appointed by the trustees of the Foster Welfare Foundation. The judges will be doctors not residing in Grand Rapids and preferably those on university staffs. A dinner will be held in June 1941, at which time the prizes will be awarded, together with a suitable medal or certificate to be given to each prize winner.

MINNESOTA

Clinical Program of Alumni Association.—The Minnesota Medical Alumni Association will conduct a one day clinical program, October 25, the day preceding the university homecoming celebration. Beginning at 9 o'clock in the morning there will be presented in the Eustis Amphitheatre of the University Hospitals a series of half hour demonstrations and lectures by members of the faculty and by members of the class of 1920, which is holding its twenty year celebration on the same day. The speakers will include Drs. Henry E. Michelson, Thomas J. Kinsella, Adelbert L. Dippel, Leo G. Rigler, George E. Fahr, Minneapolis; Siegfried F. Herrmann, Tacoma, Wash., and Elexious T. Bell, Minneapolis. At the conclusion of the clinical program, the annual meeting of the association will be held under the leadership of Dr. Harold G. Benjamin, Minneapolis, president. The program will conclude with a luncheon.

MISSOURI

Personal. — Dr. Katherine Bain, St. Louis, has been appointed director of the division of research in child development in the U. S. Children's Bureau, it is reported. She will supervise research projects which the bureau has under way in various medical schools, dealing particularly with rickets and the newborn. Her headquarters will be in Washington, D. C. Dr. Bain graduated at Washington University School of Medicine, St. Louis, in 1925.

NEW JERSEY

Autumn Tuberculosis Meeting.—The New Jersey Tuberculosis League will hold its annual fall meeting at Plainfield, October 25, with the following speakers: Emil Frankel, Trenton, "The Sanatorium in the New Jersey Tuberculosis Program"; Dr. Allen W. Freeman, Baltimore, "What Principles Should Guide the Programs of Tuberculosis Associations in the Light of the Epidemiology of Tuberculosis?" and Dr. Charles S. Prest, Brooklyn, "Mass Testing of the Adult Population."

NEW YORK

Society News. — Dr. William Thalhimer, New York, addressed the Medical Society of the County of Westchester, White Plains, September 17, on "The Use of Human Serum in Combating Infectious Diseases and in Treating Shock."——Dr. Arthur J. Wallingford, Albany, addressed the Dutchess County Medical Society, September 11, on gynecologic problems.——Dr. James P. Leake of the U. S. Public Health Service, Washington, D. C., addressed the Medical Society of the County of Nassau, Garden City, September 24, on "Communicable Disease Control."——The New York State Association of Public Health Laboratories will hold its mid-year meeting at the division of laboratories and research, State Department of Health, Albany, November 1.——Dr. Samuel A. Levine, Boston, addressed the Rochester Academy of Medicine, October 1, on errors in cardiac diagnosis.

New York City

Dr. Rappleye Named Commissioner of Hospitals.—Dr. Willard C. Rappleye, dean of the College of Physicians and Surgeons of Columbia University, has been appointed commissioner of hospitals, succeeding Dr. Sigismund S. Goldwater. Dr. Rappleye has been granted a fifteen months leave of absence from his university position. He was to begin his new work October 2. Born in Marinette, Wis., in 1892, Dr. Rappleye graduated at Harvard Medical School, Boston, in 1918. He was chief of clinical laboratories and instructor in biochemistry at the University of California, 1919-1920, and director of hospitals there in 1921. He was superintendent of the New Haven Hospital from 1922 to 1926 and professor of hospital administration at Yale University, 1922-1925; director of study, Commission on Medical Education, 1925-1932. He has been dean at Columbia since 1931 and professor of medical economics since 1932; acting dean of the School of Dental and Oral Surgery at Columbia, 1933-1934, and dean since 1934. Since 1933 Dr. Rappleye has been director of the New York Post-Graduate Medical School and Hospital. Dr. Goldwater recently resigned as commissioner of hospitals to devote full time as head of the Associated Hospital Service.

OHIO

Hospital News.—The Cleveland City Hospital is offering its third lecture course for practicing physicians during October. Lectures are held Mondays, Wednesdays and Fridays, each followed by a question period. Among the subjects to be covered are patch tests in contact dermatitis, how to give insulin, paranasal sinusitis, nonallergic asthma, various phases of heart disease, chemotherapeutic drugs, anemias and use of testosterone propionate.

Society News.—Dr. Roy R. Grinker, Chicago, will address the Academy of Medicine of Cincinnati, October 15, on "The Interrelation of Neurology, Psychiatry and Psycho-Analysis." Dr. Edwin P. Alyea, Durham, N. C., will be the speaker, October 22, on "Chemotherapy in Nonspecific Urinary Tract Infections."——Dr. Warren H. Cole, Chicago, addressed the Montgomery County Medical Society, Dayton, October 4, on "'Diseases of the Gallbladder."

Veteran Physicians Honored.—Six Lorain County physicians who have practiced more than forty-five years were honored at a dinner given by the Lorain County Medical Society, Lorain, September 10. They were Drs. Olney B. Monosmith and William E. Wheatley, Lorain; George E. French and Austin S. McKittrick, Elyria; George C. Jameson, Oberlin, and Frank B. Gregg, Wellington.——Dr. William B. Litten, West Bedford, was the guest of honor at a reception recently celebrating his sixtieth year of practice.

OKLAHOMA

Personal. — Dr. James T. Bell, Woodward, has been appointed director of the department of maternal and child health in the state department of health to succeed Dr. Paul J. Collopy, Oklahoma City, who resigned to join the staff of the Children's Hospital, Seattle, Wash.——Dr. Louis N. Dakil, Mayetta, Kan., has been appointed physician of the Quapaw Indian Agency with headquarters in Miami, succeeding Dr. Joseph H. Coogan, transferred to an agency in Nevada.

Another Medical Supplement. — *The Daily Oklahoman*, Oklahoma City, published a medical supplement, September 22, in cooperation with the Oklahoma County Medical Association. The supplement was published in tabloid form and consisted of twenty pages, the front page being devoted to an original drawing in color. In an editor's note it was stated that "For ethical reasons it has been impossible to use the names of various doctors on many stories appearing in this section. On others, more general in scope, use of names has been permitted. In every instance the material has been prepared by competent authorities in the various fields." A similar supplement was published in September 1939.

PENNSYLVANIA

Society News. — Speakers at a meeting of the Clearfield County Medical Society, Philipsburg, September 26, were Drs. George P. Müller, Philadelphia, on "Treatment of Surgical Complications of Peptic Ulcer"; Edward L. Bortz, Philadelphia, "Modern Treatment of the Diabetic," and William Raymond McKenzie, Baltimore, "Cancer of the Larynx."——Herbert Koepp-Baker, associate professor of speech, Pennsylvania State College, State College, addressed the Lycoming County Medical Society, Williamsport, September 13, on "Speech Disorders."

Philadelphia

Sale of Raw Milk Banned.—Sale of unpasteurized milk for human consumption was banned in Philadelphia, October 1, under a new regulation of the board of health. Certified milk is excepted. About 8,000 quarts of raw milk is sold daily in Philadelphia out of a total of 800,000 quarts consumed. It is produced on twenty-one model farms under supervision of a raw milk commission set up four years ago, according to a newspaper account. Under the new plan they will be compelled to pasteurize the milk if it is sold in Philadelphia.

Society News.—A doctors' and dentists' night was observed by the Philadelphia County Medical Society, October 9, with Drs. Lester W. Burket and Robert H. Ivy as the speakers on "The Equal Importance of Mouth Lesions to Physicians and Dentists" and "Diagnosis of Lesions of the Mouth and Jaw" respectively. Both speakers are also dentists. The meeting was arranged in collaboration with the Philadelphia County Dental Society.——Speakers at a meeting of the Obstetrical Society of Philadelphia, October 3, were Drs. Clarence C. Briscoe and Robert A. Wilson, Brooklyn, on "'Emergency Control of Postpartum Hemorrhage: Experience with the Supplementary Technic" and William G. Leaman Jr., "Some Cardiological Factors of Importance in Obstetric Practice."——Dr. John B. Flick addressed the Philadelphia Academy of Surgery, October 7, on "Lobectomy for Chronic Pulmonary Suppuration."

SOUTH CAROLINA

District Meeting.—A semiannual meeting of the Second District Medical Society was held in Columbia recently with the following speakers: Drs. Paul H. Ringer, Asheville, N. C., on "General Management of Tuberculosis"; David S. Asbill, Columbia, "Concretions in the Nose and Throat," and Francis E. Zemp, Columbia, "Helpful Points in Determining Heart Disease."

Society News. — The Fairfield County Medical Society, which had been inactive for several years, was reorganized at a recent meeting in Winnsboro. Officers elected included Drs. John C. Buchanan Jr., president; Samuel Lindsay, vice president, and Charles S. McCants, secretary.——Lieut. Col. Clyde C. Johnston, surgeon of the Eighth Division, U. S. Army, Fort Worth, Texas, addressed the Columbia Medical Society, Columbia, September 9, on "Military Medicine."

Personal. — Dr. Joseph H. King, Summerton, has been appointed health officer of Chester County to succeed Dr. Yeadon M. Hyer, recently transferred to Hampton and Allendale counties.——Dr. Lloyd W. Luttrell, Spartanburg, has been named health officer of Pickens County.——A portrait of Dr. Jane Bruce Guignard, Columbia, was presented to the Columbia Hospital, September 24, by her patients. Dr. Guignard was graduated from the Woman's Medical College of Pennsylvania in 1904 and has practiced in Columbia since 1905.

WASHINGTON

New Health Officers.—Dr. Lawrence E. Foster, formerly of Monticello, Ill., has been appointed head of a new health unit in Jefferson County, with headquarters in Port Townsend.——Dr. Ralph M. DeBit, Kennewick, has been appointed health officer and county physician of Benton County, succeeding the late Dr. LeGrand Spaulding. Dr. Russel L. Baker, White Salmon, has been appointed health officer for Klickitat County.

Society News.—Speakers before the King County Medical Society, Seattle, September 16, were Drs. Kenneth K. Sherwood, on "Medical Aspects of Postoperative Complications"; John E. Nelson, "Appraisal of the Tuberculin Tests," and Pius A. Rohrer, "Renal Tuberculosis—A Follow-Up Study."

All are from Seattle.——A round table discussion of cancer was presented at a meeting of the Spokane County Medical Society, Spokane, September 12, by Drs. Horace J. Whitacre, Tacoma, as interrogator; James M. Nelson, Spokane, discussing surgery; Bernard D. Harrington, Tacoma, radiology; George A. C. Snyder, Spokane, pathology, and Donald G. Corbett, Spokane, urology.

WISCONSIN

Personal.—Dr. Jefferson F. Klepfer, acting superintendent of the Central State Hospital for the Insane, Waupun, since the death of Dr. William A. Deerhake, April 10, has been appointed superintendent.

Society News.—Drs. George B. Noyes, Centuria, and Anton N. Nelson, Clear Lake, addressed the Polk County Medical Society, Amery, August 15, on "Inguinal Hernia in Small Infants" and "Speech Defects" respectively.——Drs. Robert S. Baldwin and Stephen Epstein, Marshfield, addressed the Trempealeau-Jackson-Buffalo Counties Medical Society in Blair, August 22, on "Management of Diabetes" and "Common Skin Diseases" respectively.——Drs. Henry A. Romberg and Reuben H. D. Bitter, Oshkosh, addressed the Winnebago County Medical Society, Oshkosh, September 5, on military medical service.

ALASKA

Dr. Worley Transferred to Minneapolis.—Dr. James F. Worley, senior surgeon, U. S. Public Health Service, medical director of the Alaska division of the Indian Medical Service, Juneau, has been transferred to Minneapolis as medical director of district number 1, comprising the states of Michigan, Wisconsin, Minnesota, Iowa, Nebraska and North and South Dakota.

HAWAII

Society News.—Dr. Theodore L. Althausen, San Francisco, addressed the Hawaii County Medical Society, Hilo, August 6, on "Clinical Management of the Disturbance of Carbohydrate Metabolism in Hyperthyroidism." In July Dr. Ludwig A. Emge, San Francisco, gave a series of lectures on obstetrics under the auspices of the bureau of maternal and infant hygiene, and Dr. Isidor S. Ravdin, Philadelphia, lectured recently on "Gastric and Duodenal Ulcers," "Problems of the Biliary Tract" and "Preoperative and Postoperative Treatment." Dr. Ravdin also held a surgical clinic at the Hilo Memorial Hospital.

GENERAL

Aero Medical Association.—The twelfth annual meeting of the Aero Medical Association of the United States will be held in Memphis, Tenn., October 25-27, with headquarters at the Hotel Peabody. Among papers announced in the preliminuary program are:

Dr. Walter M. Bartlett, Benton Harbor, Mich., The Use of Combined Electrocardiography, Electrostethography and Cardioscopy in the Early Recognition of Heart Disease as Especially Applied to the Selection of Pilots.
Capt. Otis A. Benson Jr., U. S. Army, Data of Experimental Work from the Metabolism Laboratory of the Mayo Clinic.
Dr. Edward J. Van Liere, Morgantown, W. Va., The Effect of Anoxia on the Digestive Processes.

Association of Medical Colleges.—The fifty-first annual meeting of the Association of American Medical Colleges will be held at the University of Michigan, Ann Arbor, October 28-30. The speakers will include:

Dr. Willard C. Rappleye, New York, The Internship.
Dr. James D. Bruce, Ann Arbor, The Expanding Phases of Postgraduate Medical Education.
Donald E. Cummings, B.S., Denver, Industrial Hygiene Instruction for Medical Students.
Dr. Burton D. Myers, Bloomington, Ind., Teaching of Anatomy.
Dr. Paul D. Lamson, Nashville, Tenn., Teaching of Pharmacology.
Dr. Linn J. Boyd, New York, Some Observations on the Teaching of Pharmacology.
George H. Smith, Ph.D., New Haven, Conn., Teaching of Bacteriology.
Dr. George E. Wakerlin, Chicago, A Plan for the Protection of Medical Research.

Society News.—Dr. Abraham R. Hollender, Miami Beach, Fla., was chosen president-elect of the American Congress of Physical Therapy at the annual meeting in Cleveland, September 2-6, and Dr. Nathan H. Polmer, New Orleans, was installed as president. The following were elected vice presidents: Drs. Fred B. Moor, Los Angeles; Kristian G. Hansson, New York; Miland E. Knapp, Minneapolis; Walter S. McClellan, Saratoga Springs, N. Y., and Herbert Worley Kendell, Dayton, Ohio. Dr. Richards Kovacs, New York, is the secretary. The annual awards of merit were presented to Drs. Hollender; George W. Crile, Cleveland; Disraeli W. Kobak, Malcolm T. MacEachern and William F. Petersen, Chicago; Horatio B. Williams, New York, and Charles F. Kettering, Sc.D., Dayton, Ohio, general manager of the research laboratories of the General Motors Corporation and founder of the Kettering Department of Medical Research at the Miami Valley Hospital, Dayton.

American Dietetic Association.—At the annual meeting of the American Dietetic Association at the Hotel Pennsylvania, October 20-24, the program will include the following medical papers:

Dr. Eugene F. Du Bois, New York, Fewer and Better Diets.
Dr. Carroll E. Palmer, U. S. Public Health Service, Appraising Vitamin Status from the Standpoint of Normal Nutrition.
Dr. Norman H. Jolliffe, New York, Recent Advances in Clinical Applications of the B Vitamins.
Dr. Abraham H. Aaron, Buffalo, Diet in Diseases of the Digestive Tract.
Dr. Dana W. Atchley, New York, Water Metabolism.
Dr. John D. Stewart, Boston, Nutritional Care of Surgical Patients.
Dr. Herbert Pollack, New York, What the Dietitian Should Know About Clinical Laboratory Methods.
Dr. William Schmidt, New York, Nutritional Deficiencies of Adolescence.
Dr. William S. Langford, New York, Psychological Aspects of Feeding in Early Childhood.

Changes in Status of Licensure.—The New York State Board of Medical Examiners has recently reported the following action:

Dr. Irving Klinger, New York, license suspended, July 19, for one year.
Dr. Nicholas A. Tonis, New York, license suspended, July 19, for one year.
Dr. Emanuel L. Stammer, Jamaica, license suspended, July 19, for one year.

The State Medical Board of Ohio has reported the following action:

Dr. Reuben B. Jackson, Nashville, Tenn., Ohio license based on reciprocity with Tennessee revoked, July 2, following his conviction for violation of the federal narcotic laws.
Dr. Weah N. Sherrill, Cincinnati, license revoked, July 2, for conviction of a felony and violation of the federal narcotic laws.

The Wisconsin State Board of Medical Examiners reports the following action:

Dr. Elgie Kraut, Lancaster, license restored July 9.

Conference on Applied Nuclear Physics.—The American Institute of Physics in cooperation with the Massachusetts Institute of Technology will hold a Conference on Applied Nuclear Physics at the Institute in Cambridge, Mass., October 28 to November 2. The activities will be divided into separate sessions on applications to biology, chemistry, radiology, metallurgy, geology and general sessions relating to the production and use of radioactive and stable isotopes and the protection of workers from radiation. Of interest to physicians will be sessions on "General Aspects of Cancer Therapy" and "Radium and Roentgen Therapy" on Tuesday, October 29; "Neutron and Artificial Radioactivity Therapy" on Thursday, October 31; "Dosage Measurements" and "Radiology" on Friday, November 1. Robley D. Evans, Ph.D., Massachusetts Institute of Technology, is chairman of the program, and members include Gioacchino Failla, D.Sc., of Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, and Ernest O. Lawrence, Ph.D., of the University of California, Berkeley.

Deaths in Other Countries

Dr. Julius Wagner-Jauregg, winner of the Nobel Prize in 1927 for his work in the use of malaria fever in treating paresis, died in Vienna, October 1, aged 83. Born in Wels, Upper Austria, March 7, 1857, Dr. Wagner-Jauregg made his medical studies in Vienna, receiving his degree of doctor in 1880. He was connected with the department of experimental pathology at Vienna from 1876 to 1882 and with the clinic in psychiatry from 1883 to 1889. He served as extraordinary professor of neurology and psychiatry in Graz from 1889 to 1893. In the latter year he returned to the University of Vienna as professor, serving until 1928 when he reached the retirement age. In 1887 there appeared his first work on the action of febrile diseases on the psychoses in which he recommended particularly the use of malaria. In 1917 he began his malarial injections for the treatment of progressive paralysis and other psychoses. His contributions to medical literature were numerous, including "Myxedema and Cretinism," a "Textbook of Organotherapy" and "Prevention and Treatment of Progressive Paralysis by Malaria Therapy." In 1938 an award of $1,000 and a medal were presented to Dr. Wagner-Jauregg by the Committee on Research in Syphilis, an American committee, through the Austrian consul general at a special meeting in New York. In his honor, the name of the Vienna Neurologic Clinic was changed to the Wagner-Jauregg Clinic.

CORRECTIONS

Number of Doctors in Georgia.—In a medical economic abstract in the Organization Section of THE JOURNAL, September 28, page 1108, it was stated that in Georgia for the state as a whole there is one physician to 1,560 of population. According to the 1940 American Medical Directory, Georgia has a population of 3,073,000. The number of physicians is 2,825, thus giving Georgia one physician to 1,088 of population.

Number of Deaths from Asphyxiation.—In the article by Beck, Schulze and Suter entitled "Carbon Monoxide—A Domestic Hazard," in THE JOURNAL, July 6, an estimate of the number of deaths from asphyxia occurring annually in the United States was given as about 50,000. Mr. A. D. Battey, statistician of the National Safety Council, Inc., in Chicago, writes that, based on the U. S. Census Bureau Reports for 1938, it would seem that the total of accidental and suicidal deaths which might be classified as asphyxiation was in the neighborhood of 9,500, and if to this was included also the cases of drowning, the grand total would be only about 18,000. Dr. Beck states that he quoted the foregoing number from the *Ohio Health News* of May 1, 1937. A reply to an inquiry addressed to the Ohio State Department of Health stated that it was unable from the files to justify the statement which had been made in the *Ohio Health News* and that the persons who were responsible for the editing of that particular issue are no longer connected with the Ohio State Department of Health.

Government Services

Wellcome Prize Awarded to Captain Johnson

The 1940 award of the Sir Henry S. Wellcome gold medal and a cash prize of $500 have been made to Captain Lucius W. Johnson, medical corps, U. S. Navy. Competitors from the various branches of the government services were invited to present essays on the subject "Medical and Sanitary Care of the Civilian Population Necessitated by Attacks from Hostile Aircraft." The award will be presented at the annual meeting of the Association of Military Surgeons in Cleveland, October 10-12, and the prize essay will be published in the *Military Surgeon*, the official publication of this association. Captain Johnson's contributions to medical literature have been numerous. His awards have included the Navy Cross for relief work in Santo Domingo in 1930 and the Kober Prize and Lectureship on the subject of plastic surgery in 1936. Captain Johnson is under orders to serve as commanding officer of the navy's first mobile base hospital. Recently his duty has been to serve the bureau of medicine and surgery in an advisory capacity on hospital construction.

Microfilm Service of Army Medical Library

A new microfilm service has been established in the Army Medical Library in Washington, D. C. It will be conducted on a nonprofit basis solely for making the extensive medical literature collections of the Army Medical Library available to research workers who are unable to come in person to consult them. The library cooperates by providing the necessary space for the work and by supplying the publications from which the microfilm copies are made. The only cost to the user is for the actual labor and materials required in making and distributing the microfilm copies. The photographic copies on moving picture film of the separate articles in the periodicals are made at 30 cents for each complete article not exceeding thirty pages in length and ten cents for each succeeding ten pages or fraction thereof. A pamphlet describing the service and also containing the latest list of the approximately 4,000 medical and related periodicals currently received by this library will be sent to those desiring to avail themselves of this service. In addition to medical periodicals the library also possesses an extensive collection of manuscripts and incunabula of which microfilm copies may be obtained. Requests should be made to Microfilm Service, Army Medical Library, Seventh Street and Independence Avenue S.W., Washington, D. C. The new service was financed by a group of "Friends of the Army Medical Library." For nearly three years microfilm copying from the medical collections of the library has been conducted by Bibliofilm Service, a nonprofit agency having its headquarters in the library of the U. S. Department of Agriculture.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 31, 1940.

The Use of Sulfonamide Derivatives in the Army

The War Office has issued a memorandum on the use of the sulfonamide derivatives for the guidance of army medical officers, which, however, is of wider interest, for it has been compiled by the leading experts of the day and is the last word on the subject. It is recommended that sulfapyridine should be given in gonorrhea, cerebrospinal fever, pneumococcic infections, staphylococcic septicemia and gas gangrene. But as supplies are not unlimited, economy should be observed. Sulfanilamide should be the drug of choice in the prophylaxis of wound infection and the treatment of erysipelas, cellulitis, meningococcus carriers, the acute phase of wounds known to be infected with hemolytic streptococci, follicular tonsillitis, otitis media and Bacillus coli urinary infections. But sulfanilamide is inactive against all pneumococci excepting type III and has little action on staphylococci. The principle of effective treatment is to obtain a high blood concentration as rapidly as possible and to maintain this for a time. As the drugs are rapidly excreted, administration should be four hourly day and night. For maintaining a steady blood concentration the oral route is the best and should ordinarily be followed. But when swallowing is impossible, when gastric upset prevents absorption and in neglected cases in which no time must be lost a soluble preparation for injection is valuable. For established or developing infections, courses of treatment should seldom exceed ten days. A further course should be prescribed only in exceptional circumstances and with precautions against granulocytopenia. As a rule when infection is amenable to these drugs the result is rapid.

INFECTIONS DUE TO STREPTOCOCCI AND GAS GANGRENE BACILLI

The earlier treatment is begun the more likely is it to prevent or control an acute infection, but benefit can be expected even in established infections. A prophylactic course of sulfanilamide should be given to all wounded persons who there is reason to fear may have septic infection or gas gangrene. This should be started as soon as possible and continued for at least four days to protect the patient against the risk of later infection by streptococci in the hospital. Prophylactic treatment may be administered orally or by local application to the wound. For established infections sulfanilamide or sulfapyridine may be used. For prophylaxis the first dose should be 1.5 Gm. of sulfanilamide. Two hours later four hourly administrations of 0.5 Gm. should begin and they should be continued for four days. If it is feared that gas gangrene is already beginning, the first two doses should be doubled.

For the treatment of gas gangrene and severe streptococcic infections the first dose of sulfanilamide or sulfapyridine should be 2 Gm. Subsequent doses, starting two hours later and continuing at four hourly intervals, should be 1 Gm. After two days, as the condition improves, the interval may be prolonged, but not to more than six hours for several days. After the temperature becomes normal small doses (3 Gm. daily) should be continued for three or four days.

MENINGOCOCCIC INFECTIONS

Groups I and II meningococci are equally susceptible to sulfonamide treatment. Early treatment and the maintenance of a concentration of 5 mg. per hundred cubic centimeters of the drug in the cerebrospinal fluid for the first three days and slightly less for a further five or six days is necessary. As

long as administration continues the intake of fluids should be approximately 4 pints (2,000 cc.) daily. Sulfapyridine is slightly more effective than sulfanilamide and has the advantage of being active also against pneumococci. The total dosage in the twenty-four hours should be 8 Gm. and in extreme cases up to a maximum of 10 Gm. On starting treatment the total twenty-four hour dose should be given in the first two administrations; it should then be given in equal doses every four hours. This is done for two or three days, after which the dose is gradually reduced over the next six days to 2 or 3 Gm. daily. In cases of vomiting or difficulty in swallowing, soluble sulfapyridine 1 Gm. should be given by intramuscular injection. In fulminating cases the same should be given plus an intravenous injection of 1 Gm.

PNEUMOCOCCIC INFECTIONS

In lobar pneumonia 5 Gm. of sulfapyridine should be given in the first twelve hours in lots of 2 Gm., 2 Gm. and 1 Gm. every four hours. This is followed by 1 Gm. every four, six or eight hours according to response. When vomiting renders absorption inadequate, soluble sulfapyridine 1 Gm. should be injected intramuscularly every four hours. For pneumococcic meningitis the procedures and dosage are the same as for meningococcic meningitis. It should be remembered that with a frankly purulent focus the drug is inactive and that the common causes of pneumococcic meningitis—otitis and mastoiditis—must be looked for and drained.

A Suspicious Use of Hospital Ships Not to Be Accepted

The repeated attacks on hospital ships, despite distinctive and unmistakable markings, has been described previously. Failure to respect the Red Cross has now been followed by an attempt to misuse it as a help in waging war. Through the Swiss government the British government has received notice that the German government proposes to use vessels distinguished by Red Cross markings for the purpose of rescuing airmen shot down into the sea. The British government has replied that, while it is willing to accord to hospital ships the immunities conferred on them by the Red Cross conventions, their use in a manner calculated to interfere with the conduct of naval and military operations cannot be admitted, especially in view of the attitude adopted toward British rescue boats saving both British and German airmen and the deliberate and flagrant attacks on British hospital ships. On July 12 the British government addressed a protest to Germany, through the medium of the United States government, on many deliberate attacks on British hospital ships, including the actual sinking of three, and no reply was received from the German government. The British government does not place its own boats, used for rescuing airmen, under the Red Cross although they have been repeatedly attacked. It does not feel justified in admitting the German pretensions in respect of vessels the character and function of which are in any case open to the gravest suspicion. It is calculated that six German airmen are brought down daily in the sea. For their rescue the Germans want to be allowed immunity for sixty-four so-called hospital ships.

Lung Injury in Intact Thorax

Though lung injury in intact thorax is familiar as a possibility to most surgeons, it has received little notice in surgical literature; it is often not diagnosed and is not mentioned in recent books on athletic injuries. Probably the first case recorded in English is that reported in the *Dublin Journal of Medical Science* by the surgeon R. W. Smith. A man was knocked down by a train, which passed over his body. He was admitted to the hospital with intense dyspnea and emphysema at the root of the neck. There was no hemoptysis and he died three quarters of an hour later. The necropsy showed collapse of the right lung with extensive pneumothorax. A large quantity of blood was found around the roots of the great vessels and three lacerations in the substance of the lung, but no tear of the pleura was demonstrated. There were no fractured ribs. In the current number of the *British Journal of Surgery* Martin Fallon has reported the following case:

A medical student, aged 24, was knocked down three times in a boxing contest. An hour after the fight he felt sore in the small of the back and thought he had "pulled" a muscle. He went to bed but the pain prevented sleep and was aggravated by hiccup. On the following day he was strapped, which made him feel easier. On the third day after the fight he coughed up blood clot and was afraid to cough again. He was then seen by Fallon, who found only some bruising over the left lower ribs in front. Examination of the lungs was negative. On the following day he coughed up more dark clot. A roentgenogram showed a cavity containing fluid in the lower lobe of the left lung. No further hemorrhage occurred but yellowish green sputum was coughed up freely. Eleven days after the injury the cavity was smaller and the fluid had gone, and eighteen days afterward the cavity was barely distinguishable. Recovery was complete. As to the mechanism of this injury, it has been suggested by Gosselin that compression of the lung causes instinctive closure of the glottis, making it impossible for the pulmonary sponge to empty. The lung then bursts as a solid mass, like the spleen or liver.

Sir J. J. Thomson

Sir J. J. Thomson, F.R.S., the greatest living British physicist, the discoverer of the electron, has died at the age of 83 years. He was master of Trinity College, Cambridge, and professor of physics in the university. The Cavendish professorship was occupied in succession by Clerk Maxwell, Rayleigh, Thomson and Rutherford. No similar position was ever held by four men of such great and varied genius. In the early years of his professorship, which he attained at the early age of 27, Thomson was largely occupied in consolidating the electromagnetic theory left by Clerk Maxwell in his classic treatise. In 1893 he published "Recent Researches in Electricity and Magnetism," a kind of sequel to Maxwell's treatise. He was convinced that the next great advance in our knowledge of the relation between electricity and matter would be derived from a study of the phenomena which accompany the discharge of electricity through gases. He persisted in seeking evidence for his view that the carriers of the current in these discharges were positively and negatively charged ions formed by the disruption of the molecules of the gas. After the discovery of the x-rays in 1895 by Roentgen the mechanism of gaseous conduction was soon unraveled. But this was only the fringe of the matter. The researches of Hittorf, Crookes and others had shown that in high voltage electric discharges in rarefied gases radiation, called cathode rays, emanated from the negative pole and had various interesting properties. Among these it caused the walls of the glass bulbs used to glow with a greenish yellow light. There was some controversy as to the nature of this radiation. Thomson showed that it was a material projection of electrified atoms from the negative pole. He measured not only the speeds of the particles but also the proportion which the mass of a particle bears to its electric charge. The mass was proved to be a minute fraction of that of a hydrogen atom. This was a great advance, for the chemical atom had stood for nearly a century as an indivisible unit. It now appeared that there was a more fundamental unit—an atom of electricity, a constituent of all chemical atoms. This he originally called a corpuscle, later an electron. Thus he initiated the great revolution in modern physics and radio and photo-electricity.

Deaths

Thomas Hugh Scott, Oklahoma City; Central Medical College of St. Joseph, Mo., 1903; was commissioned as a passed assistant surgeon in the reserve of the United States Public Health Service Sept. 1, 1919, was promoted to surgeon, Nov. 19, 1919, and on March 17, 1921, was promoted to senior surgeon; on June 10, 1922, was detailed to the United States Veterans Administration and on July 25, 1922, was promoted to the rank of assistant surgeon general; commission expired on March 15, 1923, and on March 16, 1923, was given a commission as senior surgeon; was placed on inactive status, June 6, 1924, while still serving on detail with the Veterans Administration, and official status with the public health service ceased on that date; commission automatically expired March 15, 1928; for many years medical officer in charge of the Veterans Administration Facility, Hines, Ill.; aged 61; died, August 31, of cerebral hemorrhage.

Franklin Randolph Wright ✠ Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1894; an Affiliate Fellow of the American Medical Association; clinical assistant in surgery and dermatology at his alma mater from 1896 to 1902, clinical instructor of dermatology and genito-urinary diseases from 1902 to 1909, assistant professor of genito-urinary diseases from 1909 to 1920, assistant professor in charge, division of urology from 1915 to 1920, associate professor and director, division of urology from 1920 to 1936 and since 1936 associate professor of urology emeritus; member of the American Urological Association; fellow of the American College of Surgeons; urologist to St. Barnabas Hospital; aged 74; died, August 1, of coronary thrombosis, hypertension and arteriosclerosis.

George W. Jacoby ✠ New York; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1877; Bellevue Hospital Medical College, New York, 1877; member and past president of the American Neurological Association; past president of the New York Neurological Association; consulting neurologist to the Lenox Hill and Beth Israel hospitals and the New York Infirmary for Women and Children; on the consulting staff of the Craig Colony for Epileptics; author of "Child Training as an Exact Science" in 1914 and "Physician, Pastor and Patient" in 1936; aged 83; died, September 11.

Allan Stuart ✠ Medical Inspector, Commander, U. S. Navy, retired, Chatham, Mass.; Medical College of the State of South Carolina, Charleston, 1889; veteran of the Spanish-American War; entered the navy in 1900 and retired Oct. 1, 1923, on own application after thirty years' service; aged 75; died, August 18, in the United States Naval Hospital, Chelsea, of adenocarcinoma of the prostate.

George Barrow Worthington, San Diego, Calif.; Cooper Medical College, San Francisco, 1904; an Affiliate Fellow of the American Medical Association; fellow of the American College of Physicians; past president and secretary of the San Diego County Medical Society; served during the World War; at one time county health officer; aged 62; died, August 14.

Mathilde Loth ✠ New York; Yale University School of Medicine, New Haven, Conn., 1922; on the staff of the Babies Hospital; pediatrician to the Vanderbilt Clinic; instructor in pediatrics at the Columbia University College of Physicians and Surgeons; aged 44; died, August 29, in the Mount Sinai Hospital of carcinoma of the breast with metastases.

Napoleon Strock Johnson, Clanton, Ala.; Medical College of Alabama, Mobile, 1901; member of the Medical Association of the State of Alabama; vice president of the Alabama Association of Railroad and Industrial Surgeons; formerly member of the city council; served during the World War; aged 57; died, August 30, of carcinoma of the bladder.

Fred E. Thompson, Detroit; Hahnemann Medical College and Hospital, Chicago, 1902; at one time city physician; fellow of the American College of Surgeons; formerly on the staff of St. Joseph's Mercy Hospital; aged 69; died, August 13, at his summer home at Lake of Bays, Ont., Canada, of coronary thrombosis and bronchopneumonia.

Fred L. Burdon, London, Ont., Canada; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; L. R. C. S., L. R. C. P., Edinburgh, and L. R. F. P. & S., Glasgow, Scotland, 1893; formerly member of the board of health and board of education; aged 85; died, August 26, in St. Joseph's Hospital.

Herman Theodore Schlegel ✠ Wausau, Wis.; Chicago College of Medicine and Surgery, 1909; member of the American Academy of Ophthalmology and Otolaryngology; served during the World War; aged 70; died, August 9, in the Memorial Hospital of acute myocarditis and cholelithiasis.

Arthur Augustus Whittemore, Wishek, N. D.; Minneapolis College of Physicians and Surgeons, 1903; member of the North Dakota State Medical Association; formerly state health officer; at one time member of the state board of education; aged 65; died, August 6, of carcinoma.

Norton Henry Good ✠ Buffalo; University of Buffalo School of Medicine, 1905; on the staffs of the Charity Ear, Eye and Throat Hospital, Deaconess Hospital and the Lafayette General Hospital; aged 63; was drowned, August 24, while fishing at Crescent Beach, Ont.

Pleasant H. Askew Sr., Nashville, Ga.; University of Georgia Medical Department, Augusta, 1897; member of the Medical Association of Georgia; formerly mayor, member of the city council and school board; aged 67; died, August 12, in a hospital at Thomasville.

Raynor Elmore Holmes Sr., ✠ Canon City, Colo.; Northwestern University Medical School, Chicago, 1901; formerly health officer; physician in charge of the Colorado State Penitentiary Hospital; aged 68; died, August 29, in the Corwin Hospital, Pueblo.

Roscoe Daniel Smith ✠ Clarinda, Iowa; Drake University College of Medicine, Des Moines, 1909; member of the American Psychiatric Association; superintendent of the Clarinda State Hospital; aged 59; died suddenly, August 23, of coronary thrombosis.

Tenney Hall Wheatley, Brooklyn; University of Vermont College of Medicine, Burlington, 1896; for many years diagnostician for the New York City Department of Health; on the staff of the Victory Memorial Hospital; aged 72; died, August 4.

Earl Howard Marcum ✠ Bemidji, Minn.; Hahnemann Medical College and Hospital, Chicago, 1903; served during the World War; aged 61; died, August 5, in the Lutheran Hospital of gas bacillus infection following an automobile accident.

Walter Leroy Misener, Richmond, Ind.; Physio-Medical College of Indiana, Indianapolis, 1901; member of the Indiana State Medical Association; veteran of the Spanish-American and World wars; aged 62; died, August 29, of angina pectoris.

Horace M. C. Grow, Yuma, Ariz.; University of Oregon Medical School, Portland, 1926; member of the Arizona State Medical Association; served during the World War; aged 47; died, August 20, in San Diego of acute dilatation of the heart.

William John Tindall, New York; University of Vermont College of Medicine, Burlington, 1897; formerly on the staff of the Neurological Institute; aged 71; died, August 27, in the Veterans Administration Facility of cerebral hemorrhage.

Charles Bernard Yott, Indianapolis; Indiana University School of Medicine, Indianapolis, 1929; member of the Indiana State Medical Association; on the staffs of St. Vincent's and Methodist hospitals; aged 35; was found dead, August 3.

Louis Freedman, Brooklyn; Cornell University Medical College, New York, 1903; member of the Medical Society of the State of New York; aged 65; died, August 28, in Lakewood, Pa., of hypertension and coronary thrombosis.

William A. L. McLister, Brighton, Tenn.; Vanderbilt University School of Medicine, Nashville, 1884; aged 78; died, August 14, in the Baptist Hospital, Memphis, of carcinoma of the prostate with retroperitoneal metastasis.

John B. Mathis, Ullin, Ill.; Barnes Medical College, St. Louis, 1900; member of the Illinois State Medical Society; aged 68; died, August 13, in St. Mary's Hospital, Cairo, of peritonitis secondary to perforated ulcer.

Anton F. Pav ✠ Cleveland; Western Reserve University Medical Department, Cleveland, 1889; formerly on the staff of the City Hospital and St. Alexis Hospital; aged 70; died, August 10, of coronary thrombosis.

Herman Henry Rohwedder, Chicago; Illinois Medical College, Chicago, 1904; also a dentist; aged 67; died, August 26, in the Mercy Hospital, Davenport, Iowa, of arteriosclerosis, hypertension and edema of the lung.

Joseph Stanley Shinn, Troy, Ohio; Starling Medical College, Columbus, 1905; member of the Ohio State Medical Association; served during the World War; aged 61; died, August 20, of coronary thrombosis.

Elizabeth C. Earle, Grand Rapids, Mich.; Woman's Medical College, Chicago, 1884; formerly on the staff of the Butterworth Hospital; aged 83; died, August 29, of chronic myocarditis and cerebral sclerosis.

Peter Ferrini, Middleboro, Mass.; Harvard Medical School, Boston, 1927; member of the Massachusetts Medical Society; assistant superintendent of the Lakeville State Sanatorium; aged 39; died suddenly, August 5.

Francis Nicholis Maginnis, Aurora, Ill.; Chicago College of Medicine and Surgery, 1910; member of the Illinois State Medical Society; aged 68; died, August 10, in St. Charles Hospital of cerebral hemorrhage.

John Egbert Jennison ✠ San Diego, Calif.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1894; aged 72; died, August 19, in the Mercy Hospital of hypostatic pneumonia and bulbar paralysis.

Walter Clarence Simmons, Smiths Grove, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1890; formerly mayor of Smiths Grove; aged 72; died, August 23, of acute dilatation of the heart.

Sarah Gardiner Pierson, Rochester, N. Y.; Syracuse University College of Medicine, 1903; formerly on the staff of the Rochester State Hospital; aged 63; died, August 26, of arteriosclerosis and chronic nephritis.

Douglas L. Gordon, Detroit; Michigan College of Medicine and Surgery, Detroit, 1900; member of the Michigan State Medical Society; aged 63; died, August 28, in the Harper Hospital of coronary occlusion.

Joseph Emerson Welborn ✠ Evansville, Ind.; Indiana University School of Medicine, Indianapolis, 1929; on the staff of the Welborn-Walker Hospital; aged 34; died, August 18, of acute dilatation of the heart.

Orien Lee Patrick Jackson, Union, S. C.; Emory University School of Medicine, Atlanta, 1893; member of the South Carolina Medical Association; aged 68; died, August 3, in the Wallace Thomson Hospital.

Elmer Alfred Pillon, Detroit; Detroit College of Medicine, 1910; on the staff of the Providence Hospital; aged 57; died, August 16, near Leamington, Ont., Canada, of injuries received in an automobile accident.

Allen Greenleaf Crow, Newark, Ohio; Ohio State University College of Medicine, Columbus, 1915; member of the Ohio State Medical Association; served during the World War; aged 49; died, August 5.

William James Reuter ✠ Ohio City, Ohio; Medical Department of the University of Cincinnati, 1913; for many years member of the board of health; aged 51; died, August 1, of cerebral hemorrhage.

Emil Edgar Hein, St. Louis; St. Louis University School of Medicine, 1914; member of the Missouri State Medical Association; aged 49; died, August 31, in St. Albans, Mo., of cerebral hemorrhage.

John Geddes Randall ✠ Missoula, Mont., Hahnemann Medical College and Hospital, Chicago, 1898; for many years president of the school board; aged 67; died, August 15, of coronary occlusion.

Watt Orr McDaniel, Streetman, Texas; Gate City Medical College, Texarkana, Ark., 1905; member of the State Medical Association of Texas; aged 67; died in August of carcinoma of the tongue.

Thad W. Shore, Boonville, N. C.; University College of Medicine, Richmond, Va., 1898; aged 64; died, August 16, in the North Carolina Baptist Hospital, Winston-Salem, of coronary disease.

Ulric Joseph Renaud, Brockton, Mass.; Medical School of Maine, Portland, 1919; member of the Massachusetts Medical Society; aged 43; died, August 12, in the Goddard Hospital of septicemia.

Charles Ralph Spicer, Hastings, Neb.; Rush Medical College, Chicago, 1896; member of the Nebraska State Medical Association; aged 70; died, August 19, of coronary thrombosis.

Thomas Rogers Hoge ✠ Wheeling, W. Va.; Jefferson Medical College of Philadelphia, 1923; aged 45; died, August 3, in the Ohio Valley General Hospital of seminoma of the testicle.

Robert Chester Grieve, Khartoum, Sudan, Africa; University of Oregon Medical School, Portland, 1938; aged 28; was killed, August 23, as the result of a machine gun attack.

John Wood Gordon ✠ Belle Vernon, Pa.; Jefferson Medical College of Philadelphia, 1878; aged 84; died, August 6, in the Allegheny Hospital, Pittsburgh, of myocarditis.

Frank Knight Lord, Richmond, Va.; University College of Medicine, Richmond, 1908; member of the Medical Society of Virginia; aged 60; died, August 18, of nephritis.

Henry G. Horstman ✠ Murphysboro, Ill.; Missouri Medical College, St. Louis, 1895; on the staff of St. Andrew's Hospital; aged 71; died, August 11, of coronary occlusion.

Austin Fisher Clarke ✠ Oakland, Calif.; Kentucky School of Medicine, Louisville, 1892; aged 68; died, August 18, in the Peralta Hospital of nephritis and endocarditis.

James Thomas Walker, Crowder, Miss.; College of Physicians and Surgeons, Baltimore, 1886; formerly mayor; aged 78; died, July 30, at the Lambert (Miss.) Hospital.

William Perry Collins, Colman, S. D.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1901; aged 65; died, August 28, in Brookings of acute appendicitis.

Carl Arthur Smith, Evanston, Ill.; Northwestern University Medical School, Chicago, 1932; aged 40; died, August 2, at the Evanston Hospital of organic heart disease.

Roy Herman McGuire, Medora, Ill.; Washington University School of Medicine, St. Louis, 1932; aged 33; was found dead, August 24, of cerebral hemorrhage.

Herbert Le Roy Ransom, Pittston, Pa.; University of Maryland School of Medicine, Baltimore, 1910; served during the World War; aged 64; died, July 22.

Alfred William Semmens, Sacramento, Calif.; College of Medical Evangelists, Los Angeles, 1915; aged 73; died, August 11, of carcinoma of the prostate.

Guy Howard Swearingen ✠ Sac City, Iowa; Drake University College of Medicine, Des Moines, 1911; aged 59; died, August 8, of cerebral hemorrhage.

Thomas J. Henslee, Newburg, Ky.; University of Louisville Medical Department, 1890; aged 79; died, August 9, of carcinoma of the prostate.

Karl Russell, Allensville, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1897; aged 65; died, August 14, of carcinoma of the face.

Charles H. Meldrim, Savannah, Ga.; University of Georgia Medical Department, Augusta, 1893; aged 72; died, August 14, of coronary occlusion.

William David Haas, Bunkie, La.; Jefferson Medical College of Philadelphia, 1887; aged 73; died, August 26, of coronary thrombosis.

De Willis Little, Appleton, Minn.; College of Physicians and Surgeons, Baltimore, 1883; aged 80; died, August 11, of coronary embolism.

John Collier Robison ✠ Salt Lake City; Tufts College Medical School, Boston, 1904; aged 64; died, August 18, of coronary occlusion.

Joe W. Neal, Walnut Cove, N. C.; College of Physicians and Surgeons, Baltimore, 1889; aged 76; died, August 2, of lobar pneumonia.

Donald Vincent Burns, Brooklyn; Long Island College Hospital, Brooklyn, 1928; aged 39; died, August 25, of cirrhosis of the liver.

Peter Hines Williams, Raleigh, N. C.; Leonard Medical School, Raleigh, 1901; aged 62; died, August 23, of coronary thrombosis.

N. H. Stone, Tazewell, Tenn.; Lincoln Memorial University Medical Department, Knoxville, 1906; aged 76; died, August 4, of uremia.

Joseph William Droogan ✠ New York; Albany (N. Y.) Medical College, 1891; aged 71; died, August 27, of heart disease.

Albert Edward Rogers ✠ Boston; Harvard Medical School, Boston, 1890; aged 72; died, August 8, of coronary thrombosis.

Steven George Harnden, Dalton, Ark. (licensed in Arkansas in 1903); aged 72; died, August 7, of heart disease.

Correction.—In the obituary notice of Dr. William Allen Pusey (THE JOURNAL, September 7, p. 872) it was stated that his grandfather was John T. Hodgen, former President of the American Medical Association. The actual relationship was as follows: "Dr. Pusey's father, Dr. Robert B. Pusey, married Belle Brown, daughter of Alfred M. Brown, who was the son of William Brown who settled in Kentucky in 1790. Alfred M. Brown had a sister who married Jacob Hodgen of Hodgenville, Ky. One of their children was John T. Hodgen, who became a physician and settled in St. Louis and later was made President of the American Medical Association. Actually, Dr. John T. Hodgen was a nephew of the grandfather of Dr. William Allen Pusey."

Correspondence

PREVENTION OF TUBERCULOSIS AMONG RECRUITS

To the Editor:—May I call your attention to what I consider a most important phase of the problem of medical preparedness? I refer to the problem of preventing tuberculosis in the vast army of young men now to be recruited.

As a member of the Committee on Military Affairs of the American College of Chest Physicians, I have given much thought to the tuberculosis problem facing us. One phase of this has already been sufficiently emphasized, namely that of how to prevent repetition of mistakes of the past war. As is well known, an enormous price had to be paid in cost and compensation to persons with old tuberculosis who were erroneously enlisted and became ill before reaching the front or even the training camps.

I am concerned with the far more important and much more difficult problem of preventing the development of fresh tuberculosis in young recruits. Unless we can work out a carefully planned and executed campaign of intensified tuberculosis prevention especially adapted to the present exigencies, we shall be facing the great threat of an epidemic-like occurrence of a newly developed and serious type of pulmonary tuberculosis among the youths of the army.

I am basing this prediction on the conclusions reached in a scholarly treatise recently written by Dr. Israel Rappaport on "Pulmonary Tuberculosis in the Present Epidemiologic Phase," which was presented before the Canadian Tuberculosis Association at its recent summer meeting in Montreal. Permit me to quote his conclusions here, as they will best explain:

> We are now witnessing the evolution in our midst of what amounts to a practically new form of chronic pulmonary tuberculosis associated with the current changes in the epidemiology of tuberculosis. The chief characteristics of this new form of pulmonary tuberculosis we would state as follows:
>
> 1. Unlike classic phthisis it is of exogenous origin and exposure with its variations in intensity presumably plays a role in its development.
>
> 2. It occurs in individuals who at the time of exposure are not sensitive to tuberculin by our modern tests, although they have been infected with tuberculosis previously.
>
> 3. Compared with that of classic phthisis its onset is subacute or even acute and its course is far less chronic. It begins with a solitary infiltrative lesion and spreads at least at first chiefly by metastatic infiltrations, in contrast to classic phthisis, which issues from multiple nodular lesions and extends by craniocaudal progression of nodular lesions practically to its terminal phase.
>
> 4. It is the prevalent form of chronic pulmonary tuberculosis now in young adults, while classic phthisis is still the prevalent form of tuberculosis in the older age groups.
>
> 5. It is a considerably more progressive disease with a definitely higher fatality rate than that of classic phthisis.
>
> 6. It owes its evolution to the recent remarkable downward trend in the epidemiologic curve of tuberculosis, its incidence has been rising parallel with the descent of the latter and its features are readily explained from intrepretations of the relationship between epidemiology, morbidity and mortality of tuberculosis.

War has always tended to raise the morbidity and mortality from tuberculosis. It seems to me that there is more to fear on this score than there was during the last war because of the recent remarkable shift in the epidemiology of tuberculosis, which left a vast proportion of our young people unprotected against exposure to tuberculosis which was well endured by the youth of a generation ago.

I believe that essentially the same fear is implied in the recent statement of Adamson:

> We are on an immunological hotspot from which we dare not retreat for fear of disaster. It is generally agreed that it is safer to have a positive tuberculin reaction if one is to live in an infected atmosphere; since we are bringing up the younger generation with negative tuberculin reaction, we must provide an uninfected environment.

The army of young men which is now to be recruited from all sections of this country will naturally show the great differences in levels of tuberculization which now exist between them (Frost). Perhaps the majority of these young men must now be expected to have negative tuberculin reactions and hence to be unprepared to meet contact in a new environment which is often likely to be a much overtuberculized one in comparison to their home environment. Abrupt transition from a detuberculized to a relatively overtuberculized environment is the chief breeder of fresh serious pulmonary tuberculosis, particularly among young people. Recent experience with students of nursing and medicine in our hospitals should be interpreted as pointing definitely in this direction. It seems to me that these recent events might well be considered somewhat as a forerunner for that which I believe can be predicted to occur on a vastly multiplied scale among our youthful recruits. Special measures similar to those applied now in our schools of medicine and nursing should be taken in time to prevent the ravages of tuberculosis in our future army.

EDGAR MAYER, M.D., New York.

IMMUNITY TO TETANUS

To the Editor:—In reference to the editorial in THE JOURNAL, August 24, page 618, to the effect that "human beings do not acquire a demonstrable immunity against tetanus toxin as a result of environmental exposure," I wish to call attention to the article by TenBroeck and Bauer (Studies on the Relation of Tetanus Bacilli in the Digestive Tract to Tetanus Antitoxin in the Blood, *J. Exper. Med.* **37**:479 [April] 1923), published from the Department of Pathology of Peiping Union Medical College, Peiping, China.

These investigators were interested in finding an explanation for the low incidence of tetanus in China, where approximately a third of the population is eliminating tetanus bacilli in the stool (TenBroeck, Carl, and Bauer, J. H.: *ibid.* **36**:261 [Sept.] 1922) and where human feces are so generally distributed.

Their conclusions, based on titration studies, were that: 1. The serums of twenty-six persons who carried tetanus bacilli in the digestive tract all contained appreciable amounts of antitoxin. 2. The serums of thirty persons in whose stools no tetanus-like organisms were found were, with two exceptions, free from tetanus antitoxin. 3. Although we have been unable to measure accurately the antitoxin content of these human carriers of tetanus bacilli, 0.1 cc. of serum neutralizes ten or more minimum lethal doses of toxin, and it is evident that they have acquired an active immunity owing to the bacilli in the intestinal tract. 4. These results definitely prove that tetanus bacilli grow in the intestinal tract of man. 5. Many of the persons who have no tetanus bacilli in the intestinal tract and whose serum is free from antitoxin show agglutinins to tetanus bacilli. It is probable that they have been carriers of the bacilli in the past and that the agglutinins have persisted longer than the antitoxins. It seems likely, therefore, that these persons are potentially immune to tetanus. 6. If tetanus bacilli can be established in the digestive tract of man, we have a means of immunization which might be used in armies or in regions in which tetanus infections are common, though we do not recommend this method of immunization at present.

These writers reported the finding of antitoxin (0.1 cc. of serum neutralized at least ten minimum lethal doses of toxin) in fifteen of forty (37.5 per cent) specimens of serum picked at random from their Wassermann laboratory. This observation is of added interest because of the fact that in a previous study they had found that 34 per cent of seventy-eight persons in Peiping had tetanus bacilli in their stools.

The publication cited is of interest for two reasons: 1. It shows that environmental exposure to tetanus bacilli may stimulate the formation of antitoxin in the human body. 2. Support is given to the basic principle of immunization by way of the gastrointestinal tract. However, it is not to be concluded that active immunization by way of the gastrointestinal tract is either desirable or necessary. The feasibility of inducing active immunity by means of tetanus toxoid removes the necessity of resorting to peroral methods.

Ralph Spaeth, M.D., Chicago.

TREATMENT OF DIABETES

To the Editor:—In The Journal, September 21, page 1038, there appeared a letter concerning some of my remarks on the treatment of diabetes and diabetic emergencies made at a regularly scheduled conference on therapy held at the New York Hospital and Cornell University Medical College. The letter was signed by Drs. Joslin, Root, White and Marble. They disagreed with a number of the statements voiced and were emphatic in their criticism.

My outline in this conference was necessarily brief and was made to a group who understood that all the diabetic patients in our outpatient department were under periodic observation. All had been instructed in diets and many had been shown how to examine the urine for dextrose and acetone. Even though little attention is paid to glycosuria and high blood sugar at present, all the patients with glycosuria were seen every two or three weeks. This was done for two reasons: first, because we were so trained prior to the use of protamine zinc insulin and, second, because we noted no clinical deleterious effects of the glycosuria as reported by the patients who were receiving protamine zinc insulin. I agree with Drs. Joslin, Root, White and Marble that patients with severe (4 plus) ketosis should be sent to the hospital, and I regret that in my brief talk I failed to make that point clear. However, some of the patients who have been followed for months or years and who showed at times only a 1 or 2 plus acetone reaction in the urine were not sent to the hospital but were satisfactorily treated as outlined in my talk.

Dr. Joslin and his group have concentrated their attention on "two rather unusual patients" who were studied in detail in the Metabolism Ward of the Russell Sage Institute of Pathology, which has maintained the same careful technic and high standards in the study of patients since 1914. The results in these two cases were published in the *Archives of Internal Medicine* (**64**:91 [July] 1939). One of the statements made by Drs. Joslin, Root, White and Marble reads "It does not make common sense to say that an adult of average body build and activity receiving 1,640 calories daily in the form of carbohydrate 200, protein 75, fat 60 Gm. who is excreting 150 or even 100 Gm. of sugar in twenty-four hours, thus leaving a net balance of 1,040 or 1,240 calories respectively, could maintain body weight and be in nitrogenous equilibrium for a prolonged period." I cannot argue the point of whether or not "it makes sense." The facts published in detail in July 1939 clearly show that both patients studied did maintain their weights for from five to six weeks, the experimental period.

Then again Drs. Joslin, Root, White and Marble argue "Does it seem at all likely that the average diabetic patient will be symptomless while continuously excreting 10 per cent, or even 5 per cent, sugar?" Whether it seems likely or not, the patients studied were singularly free from symptoms on days when they did excrete 5 per cent and even 10 per cent of dextrose. I was just as dismayed at this turn of events as were Drs. Joslin, Root, White and Marble. Nevertheless such were my observations, and they were so recorded in all honesty.

The Boston group admits that the proof is lacking that hyperglycemia per se is damaging but insists on perpetuating "beliefs" and "implications" of its effect on infections and atherosclerosis. Too much attention has been paid to glycosuria and high blood sugar, a carryover of the preinsulin era. With the use of protamine zinc insulin these criteria must be revamped as by the use of this hormone carbohydrate oxidation is assured for about a twenty-four hour period.

To advance, medicine in general and diabetes in particular must be based on firmly established facts obtained by recognized and reliable procedures. The metabolic experiment was done under carefully supervised conditions, the personnel was well trained and the data were most reliable. The results can be questioned only if and when the Boston group, repeating this experiment, obtains contradictory data. Then Drs. Joslin, Root, White and Marble will be in a position to challenge the facts. The Boston group believes in the orthodox treatment of diabetes. I myself am not much worried about the orthodox treatment of diabetes, as records show that orthodox views have changed at least once, and sometimes oftener, in each decade since 1914. From my work I am of the opinion that there may be more than one good method of treating diabetes and its complications ketosis and coma. Based on my experimental data I have extended the technic to the outpatient department, and the report of that work will appear shortly in the *Archives of Internal Medicine,* perhaps this month. I am proud that my views of these therapeutic conferences have extended beyond the walls of the New York Hospital and that they are criticized, because in our own institution my opinions are not shared by all the staff. I encourage this spirit, as I feel that only by frank expression of opinion and criticism, supported by established physiologic principles, can diabetes as well as other controversial medical treatment be placed on a sound basis free from beliefs, implications and traditions. I have great respect for the excellent work of my Boston colleagues. I am surprised, however, when they condemn a method of treatment based on stable experimental data and supported by good clinical results.

Edward Tolstoi, M.D., New York.

"ELECTRICAL CONVULSION TREATMENT OF MENTAL DISORDERS"

To the Editor:—In the editorial in The Journal August 10 on "Electrical Convulsion Treatment of Mental Disorders" the only reference made concerning the technic is to the English article by Fleming. I should like to point out that the original technic, as utilized by Cerletti and Bini and as used in nearly all the clinics interested in the method, can be found in the English paper by McGregor and Shepley, *British Medical Journal,* Dec. 30, 1939, page 1269. These English workers first explained in detail the original technic. Fleming and his co-workers in their paper describe a technic differing from the original technic in various points, which, however, I do not wish to discuss in detail. In particular, they do not utilize the special electrodes which allow the application of a lower current intensity and a diminished time of passage of current necessary for the production of a seizure.

At the New York State Psychiatric Institute and Hospital, Dr. Kalinowsky and I have adhered to the original technic closely. We have been in constant touch with numerous clinics throughout the world engaged in this type of therapeutic procedure and from personal communications with these clinics we are able to say that several thousands of convulsions have already been produced with this method. It was just in light of the simplicity, the harmlessness and the effectiveness of the original method that we refrained from making any essential changes in the method. We also wish to recommend to American psychiatrists, with this original method, a simple technic which does not necessitate special knowledge of electrology and which may become a practical and useful routine treatment in psychiatric procedures.

S. E. Barrera, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

INDUSTRIAL NOISES AND EAR PROTECTION—ALKALI DERMATITIS

To the Editor:—**I have recently made a survey of an industrial plant and found two conditions that I should like to correct. 1. About fifteen or twenty men are working in a department where they are exposed to excessive noise, such as steam pressure exhaust. This noise has a tendency to cause changes in the ear drum with acute occupational deafness. 2. There are a like number of men employed removing what they term reject, which is hot impurities from burning limestone. These particles strike them on the arms, hands and face and cause continued irritation with pustules which sometimes become infected. Can you suggest anything these men could use in the ears that would not cause irritation to the canal and any substance they could apply to the arms and face that would prevent the infection?**

G. P. Morison, M.D., Charles Town, W. Va.

ANSWER.—1. Prior to the regular use of a device in the ears to protect workers against noises, effort should be made to eliminate the noises themselves if this is practical. In the present instance, for example, the offending steam exhaust pipe might be extended out of close proximity to the workers. In the absence of any such opportunities, some protection may be found in the wearing of "ear defenders," which are directly inserted into the external ear canal for a short distance. One type, marketed by the Mines Safety Appliances Company, provides insulation against approximately 80 per cent of air borne factory noises, in contrast to floor borne noises leading to conduction through the body. These ear defenders when inserted for the first few times may prove temporarily uncomfortable but, fitted properly and after being worn for a few days, are unlikely to prove disturbing. They do not interfere with ordinary conversation.

2. The hot impurities from limestone in addition to causing heat burns may lead to alkali dermatitis. Even though the particles themselves represent impurities and thus conceivably not quicklime, they are prone to be coated with lime dust, which is a well known source of alkali dermatitis. Alkali burns commonly are resistant to ordinary treatment, since usually a tenacious eschar is formed which acts as a foreign body and hampers recovery. By way of prevention of contact, some benefit may be derived from the application of a dense emollient material such as hydrous wool fat, containing mild acids or acid salts. Such a protective ointment, while likely to be of some benefit, usually fails as a complete source of protection. Commercial ointments protecting against alkalis are available. For safeguarding the eyes against alkalis, the wearing of tightly fitting light weight goggles may be necessary. In the type of work described high temperatures prevail, which stands in some relationship to the causation of skin disease, particularly in conjunction with alkali dust. Any temperature reductions may assume a helpful role in combating the dermatitis.

Alkali dust implanted around nail margins may not be removed by ordinary cleansing and may cause damage to nails and may favor secondary mycotic lesions. As a part of whatever protective measures are undertaken, scrupulous personal cleanliness is important.

GROWTH PROMOTING HORMONES

To the Editor:—**A girl dwarf aged 8 has a mentality average of better than normal. Is it the type that anterior pituitary preparations would help if anything will. At what age should the preparations be given, what dose, and for how long a time? Is there danger of overstimulation to the sex organs if started too soon?**

Copeland Bowers, M.D., Kokomo, Ind.

ANSWER.—The growth or somatotropic hormone of anterior pituitary extracts is concerned with the general increase in body stature. Since other hormones, such as the gonadotropic and thyrotropic hormones, of the anterior pituitary also have to do with growth, the term "growth hormone" is somewhat of a misnomer. Because it has a specific chondrotropic action it has also been spoken of as a chondrotropic hormone. Experimentally in animals this hormone has been shown to prevent epiphysial closure. Hence therapy with such a preparation must be started as soon as possible. Clinically it has been shown that, the younger the patient, the more favorable is the result.

Pure preparations of the anterior pituitary growth hormone are not available, although not all of the preparations contain the thyrotropic and gonadotropic fractions. Oral administration does not give consistent results, and the usual mode of administration is by intramuscular injection. The dosage varies from 0.5 to 1 cc. three times a week to 0.5 to 2 cc. daily. Frequent small doses are believed to be better than larger doses injected at longer intervals. If the dosage is adequate an increase in the rate of growth will appear within two to four months. However, cessation of treatment usually results in a decreased rate of growth, and hence the treatment must be continued until the optimal stature has been reached or the femoral epiphyses have united. If epiphysial union has occurred before treatment is begun, no improvement in stature need be expected; nonunion can be demonstrated by x-ray examination.

Because the gonadotropic hormone in anterior pituitary extracts is sometimes credited with inducing an early epiphysial closure, some investigators prefer to use a preparation which is free from this principle. Overstimulation of the sex organs following injections of an extract containing more than the growth hormone is held to be of secondary importance, as cessation of the injections will usually cause a regression of the sexual characters to the stage at which they should be for that age.

In addition to receiving anterior pituitary extracts, the patient should receive vitamin containing preparations such as cod liver or halibut liver oil and yeast preparations. Some clinicians have reported favorable results following the oral use of thyroid even though no evidence of hypothyroidism is present.

The fact that the patient to whom the inquirer refers has a mentality rating of average would tend to suggest an investigation for an existing achondroplasia. This condition may be determined by x-ray examination of the epiphysial ends of the long bones.

DYSTONIA MUSCULORUM DEFORMANS

To the Editor:—**A white woman aged 22 has dystonia musculorum deformans. I have tried in every way to control muscular movements but to no avail. Recently I used quinine with slight improvement. I have been told to try curare on this patient. Can you give me any information as to where I can obtain the drug, how it is administered and how often and for how long it may be given? I would appreciate a bibliography on the use of curare in the treatment of dystonia.**

M.D., New York.

ANSWER.—Treatment of dystonia musculorum deformans with curare has been carried out by Dr. M. S. Burman of New York. He obtained his preparation from Merck & Co., Inc., but so far as known the preparation has never been on the open market in this country and been used only experimentally, under strict supervision. It is believed that small quantities for experimental purposes may also be available from E. R. Squibb and Sons. The drug is one presenting considerable danger from overdosage. It has also been used experimentally in England by Dr. Ranyard West, although not specifically for dystonia musculorum deformans. Its pharmacologic action on the end plates of the motor nerves has been well known in physiology since the original experiments by Claude Bernard in 1865, and it is now well accepted that the peripheral paralysis caused by curare is due to a blocking of the nervous impulses at the myoneural junction. In doses not sufficient to cause actual paralysis, relaxation of muscular action has been observed by West, Burman and others.

The dosage, according to Burman, varies from patient to patient and depends on the weight of the individual and the extent of the muscular rigidity. Curare may be administered either intramuscularly or intravenously, and the average dystonic patient requires 25 mg. intravenously. Rarely has a larger dose than this been given, although as much as 40 mg. can be used intramuscularly. The effects usually last about two days. After treatment has been well established through a period of a number of weeks, Burman gave 30 mg. intravenously once a week. This appeared to be adequate to maintain the improvement.

The immediate effects of the injection in one patient are described by Burman as follows: The patient noticed a feeling of looseness in the muscles. The spasms tended to return at longer intervals and with less intensity than before injection. Previously unable to walk alone, the patient was able to do so after the injection, although she could not sustain a correct position for any amount of time. She could, however, pick up a glass of water and drink it, a movement that she had not been able to accomplish for several years. Other cases showed like improvement. Burman warns against the indiscriminate use of this powerful drug and suggests that other measures be also considered in the treatment of dystonia musculorum deformans. Mention is made of Putnam's results

of treatment by section of the extrapyramidal tracts of the spinal cord. It should also be noted that Hassin recently has reported on the effect of quinine in this disease, showing that large doses of this drug are decidedly beneficial. An exhibit of charts, photographs and motion pictures showing the collection of curare, the preparation of alcoholic extracts, the pharmacologic action and certain clinical features of the drug was presented as a scientific exhibit by Drs. A. E. Bennett, A. R. McIntyre and A. L. Bennett at the annual session of the American Medical Association in New York in 1940.

References:

Burman, M. S.: Therapeutic Use of Curare and Erythroidine Hydrochloride for Spastic and Dystonic States, *Arch. Neurol. & Psychiat.* **41**: 307 (Feb.) 1939.

West, Ranyard: Curare in Man, *Proc. Roy. Soc. Med.* **25**: 1107 (May) 1932.

Putnam, T. J.: Results of Treatment of Athetosis by Section of Extrapyramidal Tracts in the Spinal Cord, *Arch. Neurol. & Psychiat.* **39**: 258 (Feb.) 1938.

Hassin, G. B.: Quinine and Dystonia Musculorum Deformans, THE JOURNAL, July 1, 1939, p. 12.

PULMONARY EMBOLISM

To the Editor:—I was much impressed by de Takats and Jesser's article on "Pulmonary Embolism" in The Journal, April 13. There are two obscure points on which I would appreciate enlightenment. It is said that "two clearcut pulmonary infarcts from a well localizable source would prompt us again to expose the iliac vessels." Would this be for the purpose of ligation of an iliac vein or extraction of the thrombus through the saphenous vein? Again, "ligation of the hypogastric or common iliac veins in septic thrombosis . . . has limitations which have been the subject of previous controversy." In an instance of repeated embolism I was able to ligate the external iliac vein with a satisfactory outcome. (*Am. J. Surg.* 45: 145 [July] 1939). Will you please indicate the objections to ligation of the external, internal or common iliac veins respectively for thrombosis and embolism? Is not an attempt to extract a thrombus through the saphenous vein likely to cause separation of the thrombus and further embolism?

K. P. A. Taylor, M.D., Panama.

ANSWER.—Dr. de Takats replies: "Following two clearcut pulmonary infarcts I feel that a ligature above the thrombus is definitely indicated. My remark in regard to the ligature of the common iliac in septic thrombophlebitis refers to the old controversy which has raged in the obstetric literature with regard to its value in puerperal sepsis. Our gynecologists and obstetricians have felt that this operation was unable to prevent septicemia but the reports of Bancroft and Neuhof have been so encouraging that I quite recently planned to do one of these.

"I think there is a great deal in what the correspondent says against extracting the clot through an opening in the saphenous. Contrary to usual belief, however, the pressure in the femoral vein is positive and the brisk bleeding would expel the clot. I would do it again only in quite recent clots when the clot is soft and can readily be removed."

SULFANILAMIDE AND AZOSULFAMIDE

***To the Editor:*—I have been informed that neoprontosil (azosulfamide) has one-tenth the toxicity of sulfanilamide. Is this true?**

M.D., Texas.

ANSWER.—Some workers have reported that toxic reactions following the use of azosulfamide have been less in number and severity than when sulfanilamide is used but others claim that there is only a slight difference. Complete information on the relative toxicity has not been obtained because of variation among the species of animals used for experimental work and because the results obtained in the lower animals do not necessarily hold true for man. Many investigators believe that reduction of azosulfamide takes place in the tissues to release sulfanilamide as the active agent, while others are not so certain that this fully explains the activity of azosulfamide. The latter group does admit, however, that such a reduction probably plays a major part. The comparative lack of toxicity of azosulfamide may then be more apparent than real because (1) relatively small amounts of free sulfanilamide are released in the body and (2) the drug is rapidly eliminated from the body, from 85 to 95 per cent appearing in the urine within five hours after administration.

Although azosulfamide is considered by some to be as efficacious as sulfanilamide, Long and Bliss (The Clinical Use of Sulfanilamide and Sulfapyridine and Allied Compounds, New York, Macmillan Company, 1939) point out that, weight for weight, sulfanilamide should be six times as efficient as azosulfamide if sulfanilamide is the active agent in azosulfamide. Mellon, Gross and Cooper (Sulfanilamide Therapy of Bacterial Infections, Springfield, Ill., and Baltimore, Charles C. Thomas, 1938) also report that recent studies prove sulfanilamide to be superior therapeutically to azosulfamide. "Neoprontosil" has not been accepted to date by the Council on Pharmacy and Chemistry.

DEMENTIA PARALYTICA AND COAL MINING

***To the Editor:*—A man has been referred to me for an opinion as to the hazard involved in his returning to work as a coal miner. He has cerebrospinal syphilis. He was in a state hospital for the insane for fifteen months for dementia paralytica. He was discharged with a statement from the institution stating that he was apparently cured. His general condition now is good and he wishes to return to work. He is 47 years old. The blood pressure is 138 systolic, 84 diastolic. The blood Kahn reaction is positive. The spinal fluid Wassermann reaction is 0.1 four plus, 0.2 four plus, 0.5 four plus. He has no apparent dementia now. The deep reflexes are exaggerated. The pupils react to light and in accommodation. There is no Romberg sign. Please give me an opinion as to the hazard of his returning to work.**

M.D., Illinois.

ANSWER.—From the information provided, it is not possible to make a specific recommendation concerning the advisability of this particular patient returning to his hazardous occupation. There are general principles, however, consideration of which make possible accurate decision as to the advisability of return to employment. In the first place, the period of time after apparent recovery from a paretic psychosis is of extreme significance. If the patient in question really had dementia paralytica and recovered after fifteen months of hospitalization, it is fair to assume that he was treated with malaria or some other form of fever. If this assumption is correct, his prospects for a normal future as time passes increase exactly as time passes, i. e. the longer after apparent recovery from a paretic psychosis he maintains a normal status, the greater the chance that that status will be maintained. If the patient has maintained a normal status for five years his prospects for the future are good.

These comments relate to the status of the patient himself, without reference to his occupation. If the occupation involves hazard only to himself, it may be judged accordingly. On the other hand, if his occupation involves the necessity for action or judgment which may jeopardize the safety or lives of other people, the question is different and return to it should be forbidden.

PICROTOXIN AND BARBITURATE POISONING

***To the Editor:*—What is the largest total amount of picrotoxin used in the treatment of patients with barbiturate poisoning who recovered? I am interested chiefly in reported cases, excluding the communication by Rovenstine in 1938 to the Council on Pharmacy and Chemistry.**

M.D., Massachusetts.

ANSWER.—The literature contains close to thirty cases of barbiturate poisoning treated with picrotoxin. Recovery occurred in most of them. References are given in a Report of the Council on Pharmacy and Chemistry (THE JOURNAL, Feb. 4, 1939, p. 431). One of the largest doses of picrotoxin reported is that of a person who recovered after taking probably 671 mg. given intramuscularly over a period of four days (Kohn, Richard; Platt, S. S., and Saltman, S. Y.: The Picrotoxin-Barbiturate Antagonism, THE JOURNAL, July 30, 1938, p. 387). This antidote was not administered until six days after an unknown dose of phenobarbital had been taken. The patient also received apomorphine, oxygen, dextrose solution intravenously, caffeine, nikethamide, strychnine, atropine, strophanthin and ascorbic acid. In another case reported by the same authors 228 mg. was administered intravenously and intramuscularly within twenty-seven hours to a patient who took 100 grains (6.5 Gm.) of barbital and 10 grains (0.65 Gm.) of pentobarbital and recovered. In the first case all the drug was given intramuscularly, in the second mostly by vein.

The largest dose of picrotoxin given in any case of barbiturate poisoning is probably that of E. A. Rovenstine (*Am. J. M. Sc.* **196**:46 [July] 1938) to which the writer refers. This patient took 500 grains (32.5 Gm.) of barbital and showed signs of recovery with each injection of picrotoxin up to a total of 2,134 mg. but finally had convulsions and succumbed on the eighth day to hypostatic pneumonia and acute hepatitis.

The amount of picrotoxin which may be prudently injected to antagonize a barbiturate depends on the dose of the latter. Large nonfatal doses of the hypnotic are likely to tolerate the largest amounts because of the physiologic antagonism between the two drugs. Small nonfatal doses are likely to respond with rigidity and convulsions even to small doses of picrotoxin. With doses of barbiturate in and above the fatal range, it may be expected that small doses of picrotoxin will prolong the course as much as heroic doses, which may even hasten respiratory failure. Kohn, Platt and Saltman pointed out that picrotoxin convulsions are followed by increased depression and that it is safer simply to increase the picrotoxin injections to the point of spontaneous movements. To reach this stage they recommend repeated intravenous injections; to sustain it, intramuscular administration.

EFFECT OF PNEUMONIA AND SULFAPYRIDINE ON ASTHMA

To the Editor:—**In January 1940 I treated a man aged 65 for type VI pneumonia with sulfapyridine. The same patient has been suffering for twenty-five years with bronchial asthma. The asthmatic attacks have been severe, especially in the hot summer days with paroxysmal dyspnea, which has been intense and suffocative. These attacks are relieved by smoking a mixture of belladonna and stramonium leaves. However, this summer the patient did not have any attacks in spite of the hot weather and appears comfortable nor does he show any signs of dyspnea. I should like to attribute this to a change in allergy as a result of the pneumonia treatment with sulfapyridine. My question now is whether any other medical men have had the same experience. Would you also advise me to treat other persons who have bronchial asthma with sulfapyridine?**

M.D., New York.

ANSWER.—There are two possible explanations for the relief from attacks of asthma in this patient. It has been known for many years that fever of any sort frequently brings about a temporary cessation of allergic symptoms, e. g. asthma, hay fever, urticaria and allergic rhinitis. When an asthmatic person develops pneumonia or a severe infection of the upper respiratory tract, malaria or any other febrile condition, the asthma is apt to disappear in whole or in part. A large carbuncle can bring about a similar improvement. But, sooner or later, in from a week to a year or perhaps longer, symptoms almost invariably return. Because of this fact, fever therapy has been tried, with conflicting results, in many allergic individuals. This explanation is probably the correct one. The fact that this patient improved so startlingly after pneumonia would suggest that some form of fever therapy might well be tried later if symptoms should return.

Sulfapyridine has been tried in bronchial asthma but its use is so recent that authentic reports are not available. Asthma is a condition which tends to recur and no reports regarding the efficacy of various procedures are of much value until a year or more has elapsed after the treatment has been started. Asthma in many cases is influenced and perhaps even caused by bacteria. The role of bacteria in allergy is extremely debatable. Perhaps sulfapyridine or a related chemical may help by killing bacteria in the bronchial tubes. To date the results from its use in asthma are not too good, but it would seem well worth while to try out all these drugs in the various allergic conditions. The experiments should of course be well controlled.

INCREASED BLOOD PRESSURE AFTER HEAT EXHAUSTION

To the Editor:—**I have under my care a patrolman aged 46 with a blood pressure reading of 160/90 prior to August 8. On August 8 while on patrol duty he was overcome by the heat of the sun. He complained of dizziness and headache and had signs of general prostration. Since that date his blood pressure has been systolic 180-220 and diastolic 120-150. I would appreciate it if you would give me any information concerning the effects of the sun on blood pressure. Is it possible that the effects of the sun would give an elevation of blood pressure?** **M.D., New Jersey.**

ANSWER.—The question does not make clear whether the reading of the arterial tension at 160/90 was an isolated single observation or representative of the average level prior to the heat prostration. The difference is significant in interpreting the subsequent changes; a single observation may easily be grossly misleading by either temporary depression or transient elevation of the arterial tension from habitual levels. In the spastic phase of hypertensive disease, wide fluctuations between different observations are the rule. It is therefore possible that the heat prostration has had no real effect on the patient's arterial tension.

The effects of the sun as described are those of excessive heat. Heat exhaustion varies greatly in severity. In the more severe cases with hyperpyrexia the mortality is high, especially among older persons and those with preexisting disorders. Alcoholism greatly increases the injury and risk from exposure to excessive heat. The more common sequels of heat exhaustion include headache, vertigo, impairment of memory, hemiplegia and paraplegias. The most conspicuous pathologic manifestation in the brain is edema, but small hemorrhages are not rare (McKenzie, Pierce, and LeCount, E. R.: Heat Stroke, THE JOURNAL, July 27, 1918, p. 260). With preexisting hypertension the probability of cerebral vascular accident is enhanced. The dehydration which is a conspicuous phenomenon of acute heat prostration is a source of renal injury. Renal insufficiency frequently follows when nephritis exists prior to the heat exhaustion and some evidence of renal injury is the rule.

Though exacerbation of hypertension is usually not enumerated as one of the more common consequences of heat prostration, it is clear that there are two possible mechanisms by which such a sequel may arise: cerebral edema and/or hemorrhage and renal injury with exacerbation of functional impairment. Neurologic and renal functional study of the patient are indicated to determine which of these mechanisms is responsible or whether both are involved.

CORONARY DISEASE AND PAPAVERINE

To the Editor:—**What is the status of the use of papaverine in coronary disease? With the dosage of one-third grain (0.02 Gm.) of papaverine hydrochloride twice daily, how long could this therapy be maintained without cumulative effects?** **M.D., New York.**

ANSWER.—Little use has been made of papaverine in coronary disease. Its chief therapeutic application in circulatory disease has been in the attempt to produce peripheral vasodilatation. In cases of peripheral vascular disease papaverine hydrochloride can be given intravenously in the dose of one-fourth grain (0.016 Gm.) or even up to one-half grain (0.03 Gm.) dissolved in salt solution twice a day. In experimental animals papaverine has been shown to increase the coronary circulation, probably through vasodilatation. The blood pressure falls. Twenty-five years ago it was recommended for hypertension and angina pectoris as well as many other conditions but it has never gained popularity, probably because of its relative inactivity. Levy does not mention it in his chapter on the medical treatment of coronary disease and angina pectoris in the authoritative volume on diseases of the coronary arteries and coronary pain published by the Macmillan Company in 1936. White mentions it as having been suggested and tried in hypertension but does not speak of its use in coronary disease.

ALCOHOLIC INTOXICATION OR TOBACCO POISONING

To the Editor:—**I have been called to testify in the case of a man charged with drunken driving, who denies having had anything alcoholic to drink preceding his arrest for poor control of his car. The officer arresting him says the odor of alcohol was on his breath, but no physician examined him. The defendant claims that he accidentally swallowed a plug of tobacco, which he occasionally chews, after which everything got black and he knew nothing until the awakening in jail. There was no nausea or vomiting. Could swallowing this tobacco cause symptoms similar to alcoholism?** **Alvin A. Rosenberg, M.D., Morristown, N. J.**

ANSWER.—The swallowing of tobacco may produce facial flushing or pallor, pupillary dilatation or constriction, general muscular weakness and vertigo resulting in unsteady gait or impaired driving, even in habitual users of tobacco. Nausea and vomiting, however, would be expected. The odor of alcohol should not be confused with, though it may be masked by, tobacco and other substances. If the man was not actually stuporous or comatose, later amnesia rather than unconsciousness, accounting for his story, would also suggest alcoholism rather than tobacco poisoning. Detailed analysis of the officer's observations might indicate whether motor incoordination or impaired judgment was present, characteristic of alcoholic intoxication. The use of one of the chemical tests for intoxication, however, would have been particularly valuable in differentiating these conditions.

References:

Webster, R. W.: Legal Medicine and Toxicology, Philadelphia, W. B. Saunders Company, 1930.

Report of the Committee to Study Problems of Motor Vehicle Accidents, THE JOURNAL, May 27, 1939, p. 2165.

Acute Alcoholism and Shock, Queries and Minor Notes, *ibid.*, Jan. 11, 1930, p. 125.

Examinaton for Alcoholic Intoxication, *ibid.*, Sept. 12, 1931, p. 798.

OBESITY AND MANGANESE DIOXIDE

To the Editor:—**Would you please give me a little information on the safety and efficacy of manganese dioxide as an aid in the treatment of obesity? Is there any danger of manganese poisoning? I have been using just a little in 5 grain (0.3 Gm.) doses three times daily.**

M.D., Illinois.

ANSWER.—No evidence for the rationale or recognized application of manganese dioxide in the treatment of obesity has been found. No reference to it has been obtained in the medical literature.

There appears to be little danger of manganese poisoning when the material is taken by mouth, chiefly because its absorption from the gastrointestinal tract is slight. Manganese poisoning does occur rather rarely as an occupational disease, in individuals exposed to the dusts of manganese compounds. In these cases the absorption is partly by inhalation. The symptoms of poisoning are primarily those of central nervous system involvement.

A review of the subject by W. F. von Oettingen of the Department of Pharmacology, Western Reserve University School of Medicine, will be found in *Physiological Reviews* **15**:175 (April) 1935.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, October 5, page 1219.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 17-19. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: * *Regular.* Little Rock, Nov. 7-8. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, Nov. 7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, Dec. 11. *Written examination.* Sacramento, Oct. 21-24. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: * *Written.* Hartford, Nov. 12-13. *Endorsement.* Hartford, Nov. 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* Derby, Nov. 12-13. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, Nov. 11-12. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: * Tampa, Nov. 18-19. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

HAWAII: Honolulu, Jan. 8-11. Sec., Dr. James A. Morgan, 48 Young Building, Honolulu.

INDIANA: Indianapolis, June 17-19. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, Citizens Trust Bldg., Fort Wayne.

IOWA: Des Moines, Dec. 9-11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 10-11. Sec., Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Dec. 3-5. Sec., State Board of Health, Dr. A. T. McCormack, 620 Third St., Louisville.

MAINE: Portland, Nov. 12-13. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, Dec. 10-13. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 10-11. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 12-14. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MINNESOTA: * Minneapolis, Oct. 15-17. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: Kansas City, Oct. 29-31. Sec., State Board of Health, Dr. Harry F. Parker, State Capitol Bldg., Jefferson City.

NEVADA: Reciprocity with oral examination, Nov. 4. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 13-14. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, Oct. 15-16. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NORTH CAROLINA: *Reciprocity.* Durham, Dec. 3. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 7-10. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: * Oklahoma City, Dec. 11. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: * *Reciprocity.* Portland, October. *Written.* Portland, Jan. 14-16. Exec. Sec., Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia, January. Acting Sec., Bureau of Professional Licensing, Miss Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 12. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 21-22. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: Austin, Nov. 25-27. Sec., Dr. T. J. Crowe, 918-920 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 11. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 4-6. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Morgantown, Oct. 31-Nov. 2. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: * Madison, Jan. 14-17. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: Little Rock, Oct. 21. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock.

CONNECTICUT: New Haven, Oct. 12. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 21-22, Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Gainesville, Nov. 1. *Applications must be on file not later than Oct. 16.* Sec., Prof. J. F. Conn, John B. Stetson University, DeLand.

OKLAHOMA: Oklahoma City, Nov. 18. Sec. of State, Hon. C. C. Childress, State Capitol, Oklahoma City.

OREGON: Portland, Oct. 26. Sec., Mr. Charles D. Bryne, State Board of Higher Education, University of Oregon, Eugene.

RHODE ISLAND: Providence, Nov. 20. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

SOUTH DAKOTA: *Examination.* Yankton, Dec. 6-7. *Endorsement.* Dec. 21. Sec., Dr. Gregg M. Evans, Yankton.

Alabama June Report

Dr. J. N. Baker, secretary, Alabama State Board of Medical Examiners, reports the written examination for medical licensure held at Montgomery, June 18-20, 1940. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-six candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Howard University College of Medicine		(1937)*	79.9
Emory University School of Medicine		(1940)*	83.1, 90.5
Northwestern University Medical School		(1940)*	84.8
Rush Medical College		(1940)*	87, 88.3
Louisiana State University School of Medicine		(1940)*	82.2
Tulane University of Louisiana School of Medicine		(1939)*	83.4, (1940)* 86.9, 88.7, 88.8, 89.6, 91.5, 91.8, 93.1
Harvard Medical School		(1936)*	82.2, (1940)* 88.7
Long Island College of Medicine		(1938)*	88.2
New York University College of Medicine		(1940)	85.2
University of Pennsylvania School of Medicine		(1940)*	89.7, 92.3
Medical College of the State of South Carolina		(1940)*	84.6, 89, 89.4
Vanderbilt University School of Medicine		(1940)*	87.5, 88.2

* Licenses have not been issued.

Delaware July Report

Dr. Joseph S. McDaniel, secretary, Delaware State Board of Medical Examiners, reports the written examination for medical licensure held at Dover, July 9-11, 1940. The examination covered ten subjects and included 100 questions. An average of 75 per cent in each subject was required to pass. Fifteen candidates were examined, all of whom passed. One physician was licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1940)	83.1
Hahnemann Medical College and Hospital of Phila.		(1937) (1939) 82.7, 83.2	85.4,
Jefferson Medical College of Philadelphia		(1938) (1939) 84.2, 84.4, 87.8	82.6,
Temple University School of Medicine		(1934) 85, (1938) 85.2, (1939) 80	79.5,
University of Pennsylvania School of Medicine		(1938)	79.5
Woman's Medical College of Pennsylvania		(1935)	81
University of Tennessee College of Medicine		(1938)	78.1

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Pennsylvania Department of Medicine		(1908)	Penna.

Minnesota June Report

Dr. Julian F. Du Bois, secretary, Minnesota State Board of Medical Examiners, reports the written examination for medical licensure held at Minneapolis, June 18-20, 1940. The examination covered twelve subjects and included sixty questions. An average of 75 per cent was required to pass. Forty-nine candidates were examined, all of whom passed. Four physicians were licensed by reciprocity to practice medicine and two physicians so licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Southern California School of Medicine		(1937)	90
Yale University School of Medicine		(1937)	90.6
Loyola University School of Medicine		(1940) 85.1, 88.1,	91.3
Northwestern University Medical School		(1939) 87.1, (1940) 84.6,	91.4
Rush Medical College		(1938) 91,	92.1
University of Illinois College of Medicine		(1940)	89.3
Harvard Medical School		(1936) 86.6, (1937)	89.1
University of Minnesota Medical School		(1937) (1938) 89.1, (1939) 84.5,* 86.6, (1940) 82.1,* 83,* 83.2,* 84.2,* 84.3,* 84.5,* 85,* 85.4,* 85.6,* 85.6, 86, 86.4,* 86.5,* 87,* 87,* 87, 87.1, 87.3,* 87.6, 88,* 88.5,* 89.1,* 89.1,* 89.3, 90.5,* 92	91.1,
Washington University School of Medicine		(1937)	91.4
University of Pennsylvania School of Medicine		(1937)	91
Marquette University School of Medicine		(1940) 88.3, 88.6, 89.1,	89.4

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Washington University School of Medicine		(1937)	Missouri
Creighton University School of Medicine		(1939)	Nebraska
University of Nebraska College of Medicine		(1938)	Nebraska
University of Wisconsin Medical School		(1928)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Minnesota Medical School		(1938), (1940)	N. B. M. Ex.

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Book Notices

Juvenile Delinquents Grown Up. By Sheldon and Eleanor Glueck. Cloth. Price, $2.50. Pp. 330. New York: Commonwealth Fund; London: Oxford University Press, 1940.

In 1934 the authors of this book published a report covering the careers of 1,000 delinquent boys over a period of five years after they had been brought before a juvenile court. The present work continues the study of as many of the original group as could be found over an additional ten year period. The careers of delinquency or of recovery are described in five year periods, the original work of 1934 constituting the first of these periods. The fifteen years that has elapsed since these boys were before the Boston Juvenile Court, at an average age of 13½ years, have seen them enter adulthood.

The authors note a steady increase in the proportion of delinquents who abandon criminal behavior, and among those who remain delinquent the delinquencies tend to become notably less serious in character. However, a relatively large number of the offenders continue to be delinquent, 226 remaining serious and eighty-eight minor offenders throughout the entire fifteen years of record.

The authors study the factors that correlate with successful and unsuccessful outcomes and make comparisons between reformed and unreformed offenders, serious and minor offenders, and the successes and failures during intramural and extramural treatment. On the basis of differences observed in the comparisons of backgrounds and characteristics of the various groups of offenders, the possibility of predicting with reasonable accuracy the future behavior of the delinquents was explored and prediction tables were constructed based on a few selected factors.

The authors, having demonstrated that with passage of time there is a continuing decrease in the number of youths who continue to be offenders, propose the theory that "the physical and mental changes that comprise the natural process of maturation offer the chief explanation of this improvement in conduct with the passing of the years." Their study reasserts the importance of heredity, "innate equipment" and early environment in favorably influencing the course of delinquency and, presumably, the process of maturation. They are able to distinguish four "conduct types." Type 1 constitutes those who succeeded during some intramural and extramural treatments and are to be distinguished from those of type 2, who failed during both these types of treatment. Members of type 2 are shown to have been subjected to much less favorable circumstances in early life. Inadequate sense of security in early upbringing was reflected in members of type 3, who did well in intramural treatment but poorly in extramural treatment. Members of type 4, who had demonstrated their inability to get along in other group situations in life, failed in institutional treatment but did well in extramural forms of treatment. The authors offer tables predicting behavior during the various forms of penocorrectional treatment on the basis of these differences in treated offenders. It is noted in both intramural and extramural treatment that the behavior of the offenders tended to improve in time, more markedly so during intramural treatment.

The Gluecks recognize two types of "reformed" individuals, those who have achieved a maturity in physical, mental and emotional development that enables them to abandon criminality, and those who abandon criminality as a result of deterioration of their powers. The former are integrated personalities, the latter succumb to the disintegration or deterioration of their faculties.

The authors suggest that their observations, and particularly their prediction tables, could now make possible practical experimentation by courts and parole boards. Disposition of every second case by aid of the prediction tables is proposed, with an eventful follow-up of the two groups thus dealt with. The prediction tables "furnish to courts and parole boards a rational implementation of the indeterminate sentence." The prediction tables also indicate the group of criminals of whom reform or improvement is not to be anticipated.

The Gluecks have done their usual type of thorough job in covering an amazing mass of material, the accumulation of which in itself called for much resourcefulness. Their observations, their tables and their account of what actually happens to delinquents warrant the closest consideration of all students of criminal behavior. Their studies, as they explicitly state, indicate that there still is much to be learned about delinquency and about the treatment of delinquency. Their emphasis of the role of maturation in delinquency is in agreement, as they indicate, with psychoanalytic formulations of these disturbances in conduct (p. 268). "The next step in developing the theory of the relationship of maturation to delinquency and criminality is to dissect 'maturation' into its components. Such a task must be left to specialists in psychiatry, psychology, physiology, medicine and related disciplines" (p. 270). This suggestion, in effect, brings us back to the precise emphasis in the study to delinquency made by William Healy, Herman Adler and others. It is clear that for prevention of delinquency the specific factors favorably or unfavorably influencing personality growth and development must be understood for the individual delinquent. Alexander and Healy's "Roots of Crime" comes to mind. The Gluecks' suggestions relative to use of their prediction tables may have merit in reducing the guesswork in disposition of delinquents, but there is the problem that prediction tables worked out for the Boston population of delinquents might be of meager usefulness, say, in New Orleans. They properly insist that a better understanding of what actually happens to a deliquent psychologically under various forms of treatment is required. They indicate that further studies contributing to these incompletely understood problems may be undertaken by them. These will be awaited with interest by students of delinquency and criminality.

American Doctors of Destiny: A Collection of Historical Narratives of the Lives of Great American Physicians and Surgeons Whose Service to the Nation and to the World Has Transcended the Scope of Their Profession. By Frank J. Jirka. With an introduction by Harold W. Camp. Cloth. Price, $3.75. Pp. 361, with 20 portraits by Raymond Warren. Chicago: Normandie House, 1940.

This is a collection of biographic sketches of twenty doctors who, the author believes, are destined for the American Hall of Fame. One should not be too critical of his choice of candidates for this honor, for no two physicians would agree as to who should be selected or even on what basis the selection should be made. But really the group is a motley one. One finds many of the old stand-bys: Benjamin Rush, Ephraim McDowell, Daniel Drake, W. T. G. Morton, Walter Reed and General Gorgas. There are several new ones who are less widely known. The claim for the inclusion of some of these is that they selected, or had thrust upon them, some job—at times a political one—and did the job well. This is, of course, praiseworthy. But, without mentioning names, not all of these are of national caliber. And, as the reviewer looks at it, it shows poor judgment prematurely to include names of men still living and whose life work is far from finished. This is particularly true in the case of those who are apparently so intimately related in a social or medical way to the author as unconsciously perhaps, yet inevitably, to bias his judgment. One questions also the good taste shown by Dr. Jirka in permitting in the introduction extremely laudatory references to himself, with extravagant claims for his accomplishments during his short term of four years in office as director of the Illinois State Department of Public Health. Dr. Harold Camp, who writes this introduction, virtually nominates Dr. Jirka as an American Doctor of Destiny. And Dr. Jirka in a final chapter shows no resentment. The book is a medley of good, bad and mediocre. Some of the best chapters—and there are interesting ones that are well worth reading by the layman—are frankly compiled from biographies written by other hands. There are also many sentiments regarding doctors, their relations to patients and their mission as public servants that are well expressed by Dr. Jirka when writing in his own person and that must be heartily applauded. But there is a too free use of superlatives and too often one finds what sounds more like the ballyhoo of a political speaker than the sober words of an impartial, judicially minded historian or biographer. The drawings by Warren are well done. Several typographic errors have escaped the proofreader. One of these would have made Dr. Oliver Wendell Holmes smile, for it is a reference to his novel as "A Moral Antipathy."

Surgery of the Hand: Some Practical Aspects. By John Harold Couch, M.A., M.B., F.R.C.S., Department of Surgery, University of Toronto and Toronto General Hospital, Toronto. Foreword by W. E. Gallie, M.D., F.R.C.S., Dean of the Faculty of Medicine, University of Toronto. Cloth. Price, $1.50. Pp. 147, with illustrations. Toronto: University of Toronto Press; London: Oxford University Press, 1939.

The author has compressed a great deal of helpful advice and information into this well illustrated little volume. The repair of injuries of the hand, with particular reference to nerve and tendon injuries, the correct levels for amputation of individual digits, and in part II the important principles involved in the treatment of infections of the hand have been simply and clearly discussed. One point in which we believe the author's advice cannot be taken without question should be mentioned. He says (p. 52) "Movement can be instituted almost immediately after (tendon) suture has been completed, for the strength of the suture will suffice until the tendon is strongly united." The experimental work of Mason and Allen shows that at the end of from eight to fifteen days the newly forming tendon callus is soft and gelatinous; at this stage suture material can be pulled through the callus with but little tension, and movement can result in partial or complete separation at the line of suture. In other words, no form of suture material is proof against separation if mobilization is begun before the tendon callus is firm enough to prevent cutting through of the suture. This volume should prove an invaluable aid to the student and the general practitioner and should help to stimulate the ever increasing interest in this important branch of surgery.

Dynamics of Inflammation: An Inquiry Into the Mechanism of Infectious Processes. By Valy Menkin, Department of Pathology, Harvard University Medical School, Boston. Cloth. Price, $4.50. Pp. 244, with 50 illustrations. New York: Macmillan Company, 1940.

This volume represents the recent publications of the series of Experimental Biology Monographs designed to give in monographic form the most recent researches in the biologic sciences. The author attempts to describe inflammation from the physiologic, immunologic and biochemical as well as the morphologic point of view, drawing considerably on his own investigations. Inflammation in relation to infectious processes is especially emphasized. Allergic and anaphylactic reactions are discussed with reference to their role in the fixation of antigens. Leukotoxin, a crystalline nitrogenous substance, is offered as the agent responsible for capillary permeability and the migration of leukocytes to points of injury. The context and bibliography should be of value to pathologists and bacteriologists interested in the immunologic and chemical phases of inflammation.

Clinical Heart Disease. By Samuel A. Levine, M.D., F.A.C.P., Assistant Professor of Medicine, Harvard Medical School, Boston. Second edition. Cloth. Price, $6. Pp. 495, with 109 illustrations. Philadelphia & London: W. B. Saunders Company, 1940.

This is a timely book for the medical student as well as the general practitioner interested in heart disease. The subject matter is presented in simple clear fashion. Throughout, stress is laid and quite properly so on the clinical aspects of heart disease and one is impressed with the author's regard for the patient as an individual as well as the medical problems involved. The personal bedside experiences are interesting and help to emphasize the value of clinical observation and experience.

The new chapter on the medicolegal aspects of heart disease is of current interest and importance and opens up a field which will probably require more consideration in the future on the part of the medical profession. It is highly questionable, however, whether "shadowing" a patient in a medicolegal case is the physician's duty.

Thyroid heart disease with emphasis on "masked thyrocardiacs" is again stressed to help clinicians recognize that group of cases in which such brilliant results are often obtained when the underlying cause of the cardiac disability is recognized and corrected. The author's experience in the treatment of subacute bacterial endocarditis coincides with that of most clinicians. It is suggested that the use of sulfanilamide and heparin in these cases is worth trying. The chapter on acute cardiovascular emergencies should be of value to all practitioners who may be called on at almost any time to administer in such cases. The treatment of congestive heart failure has been enlarged on and more space is devoted to the subject, which after all is probably the most important part of clinical heart disease for the patient as well as for the doctor. The author's approach to the whole subject is that of the proved and experienced clinician and affords many valuable and practical suggestions for the clinical recognition, evaluation and treatment of the patient with heart failure. A sizable portion of the book is devoted to clinical electrocardiography. The value of the electrocardiogram as well as its limitations is stressed and it is gratifying to have Dr. Levine emphasize the latter and present it in its real place in cardiology. It would seem that too much emphasis and unwarranted importance have been placed on the electrocardiogram by many a present day physician to the exclusion of the more important clinical aspects of heart disease, and this book's views will undoubtedly aid in clarifying the matter. The electrocardiographic illustrations and the text of this particular chapter afford an excellent opportunity to any one interested in learning clinical electrocardiography.

This volume covers the important aspects of heart disease as encountered in practice and has a real place on the list of worthwhile textbooks for the medical student, intern and clinician.

Précis d'oto-rhino-laryngologie. Par Georges Laurens, Maurice Aubry, laryngologiste des hôpitaux de Paris, et André Lemariey, laryngologiste des hôpitaux de Paris. Second edition. Cloth. Price, $3.90. Pp. 1,241, with 460 illustrations. Paris: Masson & Cie, 1940.

This edition of Laurens's compendium follows the plan that characterizes the entire series of textbooks put out by Masson and Company in presenting a textbook that is not too involved for the student and general practitioner and yet is ample as a reference book for the young laryngologist. The new items added since the first edition comprise chapters on audiometry, petrositis, cancer of the hypopharynx, pharyngeal manifestations of hematologic conditions, dyspnea in infants and radiography in cancer of the larynx, which bring the text down to date. The author and his associates have carefully adhered to known and accepted facts and principles, avoiding items that are more or less controversial. An index of their restraint for example is manifest in their conservative discussion of retrobular neuritis in relation to posterior sinus disease, a topic on which many of the French authors are particularly radical. The book covers the vast territory in necessarily concise style and almost everything in the domain of otolaryngology receives some mention. While the illustrations are not particularly artistic, they serve the purpose. It is interesting to note that at the time the book was issued its cost in American money was only $3.90, which is remarkably cheap for a textbook of its size and character. For those who have a reading knowledge of the French language it is both interesting and stimulating to peruse this book and to note that though it differs from our own textbooks in some minor details it compares favorably with some of our best.

Artificial Limbs and Their Relation to Amputations. Ministry of Pensions. Cloth. Price, 90 cents; 3s 4d. Pp. 88, with 42 illustrations. New York: British Library of Information; London: His Majesty's Stationery Office, 1939.

The large number of casualties in the war of 1914-1918 provided an important proving ground for the development of artificial limbs. This experience was utilized by the British Ministry of Pensions to develop acceptable standards of appliances to meet the needs of amputees. The result of this work has been crystallized into the present small volume, which briefly yet completely describes ideal sites and methods of amputation, types of artificial limbs and appliances, and methods of fitting. The publication is particularly timely because of the present war and provides a basis for the management of similar problems that are sure to arise among the new amputees. The reviewer's experience has been confined for the most part to the problems of civilian amputees, but their problems and those of the war disabled are not dissimilar. However, the use of temporary prostheses such as plaster pylons has not been considered necessary in this country, since thigh lacers and other methods of preliminary shrinking have been generally considered adequate. While the book should be of value to military, industrial and orthopedic surgeons, it is of especial importance to administrative agencies which may be concerned with the problems of organization in the field of rehabilitation of the amputation cases.

Manuel de classification et de détermination des bactéries anaérobies. Par André R. Prévot, chef de service—adjoint à l'Institut Pasteur. Paper. Price, $1.15. Pp. 223, with one illustration. Paris: Masson & Cie, 1940.

The author states in the preface that he has had seventeen years of experience in working with anaerobes. He has been interested in the classification of anaerobes and is a member of the International Committee on the Classification of Bacteria. The purpose of this manual is to afford a working classification of the anaerobes. The author was urged by his friends in the army to get out rapidly a book which would be helpful to the laboratory staff in classifying anaerobes from various wound infections. This book was put out in response to that demand. The author believes that the three most important features in classifying anaerobes are spore formation, Gram stain and motility. He, of course, takes into account morphology, general physiology, cultural and biochemical reactions, pathogenicity and serologic and immunologic reactions. The book is comprehensive and catalogues the nonsporulating as well as the sporulating anaerobes, cocci, actinomycetes and spirochetes. Many new families and genera have been added. For instance, Bacillus tetani or Clostridium tetani is listed in the order of Plectridiales, the family Plectridiaceae and the genus Plectridium and is called Plectridium tetani. Bacillus welchii or Clostridium welchii is in the family Clostridiaceae and in the genus Welchia and is called Welchia perfringens. The creation of new names for the anaerobes is going to add to the long list of names which some of them now have. The anaerobes have been much neglected by medical bacteriologists and this book should prove stimulating to physicians as well as to laboratory workers.

For Daughters and Mothers. By Valeria Hopkins Parker, M.D., Director, Bureau of Marriage Council and Education for Social and Family Relations. Cloth. Price, $1.50. Pp. 138. Indianapolis & New York: Bobbs-Merrill Company, 1940.

This is a book on relationships between mothers and daughters as daughters enter adolescence. It deals largely with sex development in adolescence but also gives considerable attention to other problems, particularly the growth of independence and impatience at restraint which characterize the adolescent. The book contains much excellent advice, both for mothers and for daughters, about how to live harmoniously in spite of frequently clashing points of view due to difference in age and outlook. The chapter headings are descriptive of the content of the book, dealing as they do with childhood, new horizons and new outlooks, the chain of life, new bodies, "having a good time," looking toward romance, "how do you know when you're in love?", working plans, women of tomorrow, and the great adventure. Toward the end of the book the chapters begin to be a trifle sketchy and to give the impression of having been prepared less thoroughly than the earlier chapters. In general, however, the book can be recommended to physicians who seek books of this type to recommend to their patients.

Lectures on Motor Anomalies. By Alfred Bielschowsky, M.D. Foreword by Walter B. Lancaster, M.D. Paper. Price, $1. Pp. 128, with 62 illustrations. Hanover, New Hampshire: Dartmouth College Publications, 1940.

The twelve lectures of this monograph were delivered before the Research Study Club of Los Angeles in January 1938. They were first published in the *American Journal of Ophthalmology* in a series beginning in August 1938 and ending in August 1939. Coming from the University of Breslau in Silesia in 1934, the author gave more than a hundred lectures and demonstrations on ocular motility. Remaining in the United States as head of the Eye Clinic of Dartmouth College, Dr. Bielschowsky died suddenly in New York January 5 and was deprived of the opportunity to realize his cherished plan of writing a comprehensive textbook in English on the special field in which he attained world renown. In the foreword by Dr. Lancaster the final statement that "the lectures which are collected in this volume are a small but vivid token of his knowledge, experience and didactic ability" is indeed true. Those of us who enjoyed the privilege of hearing Dr. Bielschowsky lecture were intrigued by his simple, understandable delivery, which is reflected in this work. Controversial subjects are approached from all angles, due credit is given to various authorities with dignified humility, and the whys and wherefores of the author's own views are simply told. The author's vast experience in this limited field and his knowledge of the fundamental physiology and pathology of the ocular muscles, together with his neurologic acumen reflected in these lectures, makes for the inclusion of this volume in the library of every ophthalmologist.

The Varieties of Human Physique: An Introduction to Constitutional Psychology. By W. H. Sheldon, Ph.D., M.D. With the collaboration of S. S. Stevens, Ph.D., and W. B. Tucker. Cloth. Price, $4.50. Pp. 347, with 104 illustrations. New York & London: Harper & Brothers, 1940.

The authors point out the need for a description of human physiques which can readily be obtained and which can be of use in studies of personality and clinical problems. They outline a method for "somatotyping" an individual. It consists of photographing an individual from the front, side and back and then evaluating the figures on the negative or print. The evaluation is in part anthroposcopic and in part anthropometric. A number consisting of three digits is finally obtained. Each digit may range from 1 to 7. For example, 154 and 714 are typical evaluations. The authors claim a high degree of reliability for their evaluations. The book is easily read but unnecessarily long. Its usefulness would have been increased had it been concise. What value "somatotyping" may serve is problematic. There is without doubt a need for physical measurements on a large scale which can be used for correlation with other physical and mental characteristics, but it is questionable whether somatotyping will serve that need. Perhaps it will for a time.

St. Thomas's Hospital Reports. Edited by Prof. O. L. V. S. de Wesselow and Mr. C. Max Page. Assisted by Mr. N. R. Barrett, Dr. J. St. C. Elkington and Dr. A. J. Wrigley. Second Series. Vol. IV. Cloth. Price, 10s. Pp. 198, with illustrations. London, 1939.

Here are collected a group of papers by members of the St. Thomas staff. Some papers, such as these on oxygen therapy, cerebral abscess, empyema and orbital inflammation, are instructional and deal with technics and clinical observations and indications. A review of the male sex hormone is followed by a case report of macrogenitosomia in one of twin boys. The surgical treatment of gastroduodenal hemorrhage is discussed. The anatomic changes associated with closure of the ductus arteriosus are outlined in pathologic changes in the wall of the ductus arteriosus. Other titles include acetylcholine and potassium in relation to cardiac function, thorium-x irradiation in cutaneous therapy and estimation of the water soluble vitamins in the body fluid. The typography is excellent.

An Index of Treatment. By Various Writers. Edited by Sir Robert Hutchison, Bt., M.D., LL.D., Consulting Physician, London Hospital, London. Assisted by Reginald Hilton, M.A., M.D., F.R.C.P., Physician to St. Thomas's Hospital, London. Twelfth edition. Cloth. Price, $12. Pp. 996, with 148 illustrations. Baltimore: William Wood & Company, 1940.

In the present edition of this companion volume to the equally well known index of differential diagnosis, of which French is editor, no alterations in plan or format have been made. The number of individual contributors has been reduced from ninety-one to seventy-eight. A few subjects make their appearance for the first time, the principal ones being bone setting, rat bite fever, sebaceous cysts and syndactyly. Few of the treatises seem to have been completely rewritten—an unfortunate fact in certain instances, notably pneumonia. The book must continue to disappoint those who wish to have an unprejudiced and inclusive therapy presented in a specific fashion.

Die geburtshilflichen Operationen: Ihre Ausführung und Anwendung. Ein Lehrbuch für Studierende und Gebrauchsbuch für Ärzte. Von Prof. Dr. med. Heinrich Martius, Direktor der Universitäts-Frauenklinik Göttingen. Second edition. Paper. Price, 12 marks. Pp. 286, with 281 illustrations. Leipzig: Georg Thieme, 1940.

This book is devoted almost entirely to obstetric operations including perineal lacerations, forceps operations, breech extraction, version and extraction, manual removal of the placenta and cesarean section. At the beginning are large sections on the obstetric pelvis and the mechanism of labor. The illustrations, nearly all of which have been beautifully drawn, are the chief asset of the book. This is as it should be, because any book dealing with operative procedures should have numerous instructive illustrations. There is nothing new in the book, because its entire contents may be found in any of the standard textbooks of obstetrics. Hence the need of such a book is questionable.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Harrison Narcotic Act: "Prescribing" Narcotics for Addicts.—Defendant Heller, a physician, was prosecuted for violation of the Harrison Narcotic Act on a charge that he had entered into a conspiracy with defendant Kuhn, a pharmacist, to supply narcotic drugs to narcotic addicts, not for the treatment of bona fide patients but to satisfy the craving of addicts for their drug of addiction. The physician wrote fraudulent prescriptions which the pharmacist filled. The evidence showed that sometimes the physician left the prescriptions undated so that they might be dated by the pharmacist in such a way as to present a record that would not excite the suspicion of the narcotic inspectors. A witness for the government, a narcotic addict who claimed to be suffering from myocarditis and amebic dysentery but was able to carry on his usual occupation, testified that on week ends he traveled from his home to defendant Heller's office and returned, a distance of 180 miles each way, in order to secure prescriptions for morphine which he had filled by the co-defendant pharmacist. Forty-three prescriptions, signed by Dr. Heller, which purported to have been issued for "incurable chronic angina and chronic amebic dysentery" were introduced in evidence. An expert medical witness for the government testified that a patient suffering from myocarditis whose condition justifies the use of morphine should be at absolute rest in bed. In answer to a hypothetic question, this expert witness further testified that the use of morphine was not justified in the case of a person suffering from myocarditis whose condition was such that he was able to carry on his usual occupation and travel 360 miles each week end. In his opinion morphine is used in cases of myocarditis to relax the patient and to take as much load off the heart as possible, but for this purpose the use of a drachm (4 Gm.) every six or seven days would be indicated only in a "rather rare case." On this evidence the defendants were convicted of a conspiracy to violate the Harrison Narcotic Act. The pharmacist was admitted to probation, but the physician was sentenced to prison and so he appealed to the United States circuit court of appeals, fourth circuit.

Defendant Heller's contention, that the government's expert medical witness had not taken into account the fact that the patient was a morphine addict when he expressed his opinion as to how much morphine was proper in the treatment of myocarditis, did not meet with the approval of the circuit court of appeals. The mere fact, said the court, that a patient supposed to be suffering from myocarditis was making trips of 360 miles each week end to secure a prescription for morphine spoke so loudly as to the real situation existing that any testimony as to proper dosage for such an ailment would hardly be noticed. The court concluded that the conviction of violation of the Harrison Narcotic Act was amply sustained by the evidence. Accordingly, the judgment of conviction was affirmed.—*Heller v. United States, 104 F. (2d) 446.*

Medical Practice Act (Florida): Constitutionality; Revocation by Board on Criminal Charge Not Barred by Court Acquittal.—De Gaetani, a physician, was prosecuted and acquitted in a criminal court on a charge of criminal abortion. Subsequently the Florida state board of medical examiners, pursuant to authority granted by the medical practice act of Florida and after a hearing in a county other than that in which the alleged criminal offense occurred, revoked the physician's license to practice medicine. From an order of the circuit court, Dade County, denying the petition of the state, on the relation of the physician, for a writ of certiorari to review the action of the board, and in effect ordering a trial de novo, the relator appealed to the Supreme Court of Florida.

The appellant physician contended that his acquittal by a criminal court of the charge of criminal abortion was an absolute bar to any proceeding by the state board of medical examiners to revoke his license. The Supreme Court conceded that there is a division of authority on this question but believed the better reasoned rule to be, as it had recently announced in *State ex rel. Sbordy* v. *Rowlett* (Fla.), 190 So. 59, that an acquittal in a criminal prosecution will not bar a proceeding by the board to revoke a physician's license based on the same offense. It was not necessary that the hearing of the board be held, as the appellant argued, in the county where the cause of action accrued. In the judgment of the court, the medical practice act was not unconstitutional because it does not in terms provide a means for summoning and enforcing attendance of witnesses. In refutation of the appellant's further contention that the act was unconstitutional because in the trial de novo it does not accord the accused a jury trial, the court pointed out that the appellant had not requested such a trial and, furthermore, the proceeding before the board was not a criminal prosecution and was not therefore an action in which the appellant was constitutionally entitled to a trial by jury. The judgment of the lower court was therefore affirmed.—*State ex rel. De Gaetani v. Driskell et al., State Board of Medical Examiners (Fla.), 190 So. 461.*

Governmental Hospitals: Liability for Failure of Hospital Attendants Properly to Supervise Inmates.—In two cases the court of claims of New York held that the state was liable in damages for the negligence of attendants at a state psychiatric hospital in failing properly to supervise inmates of the institution. In one case the patient was gored to death by a bull and in the other case the inmate hung himself. Both patients were suffering from dementia praecox and in each case the attendant knew of the inmate's low mentality and suicidal tendencies. In the opinion of the court in each case the amount of damages recoverable was dependent on the pecuniary loss actually sustained by the surviving widow or children. But, in veiw of the fact that in each case the medical testimony showed that the patient had been suffering from an incurable disease and would never have been able to contribute financial assistance to his family had he lived, the court held that the surviving heirs had sustained no pecuniary loss other than the cost of burial. Accordingly, the court in each case limited recovery to the amount of reasonable funeral expenses.—*Dimitroff v. State (N. Y.), 13 N. Y. S. (2d) 458; Gaccione v. State (N. Y.), 18 N. Y. S. (2d) 161.*

Society Proceedings

COMING MEETINGS

American Academy of Pediatrics, Memphis, Tenn., Nov. 18-20. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.

American Clinical and Climatological Association, White Sulphur Springs, W. Va., Oct. 28-30. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Chicago, Oct. 21-25. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.

American Society of Tropical Medicine, Louisville, Ky., Nov. 12-15. Dr. E. Harold Hinman, Malaria Control Division, Wilson Dam, Ala., Secretary.

Central Society for Clinical Research, Chicago, Nov. 1-2. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.

Clinical Orthopaedic Society, Milwaukee and Madison, Wis., Oct. 18-19. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 15-17. Mr. Theodore Wiprud, 1718 M St, N.W., Washington, Secretary.

Indiana State Medical Association, French Lick, Oct. 29-31. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Cleveland, Oct. 14-18. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

New York State Association of Public Health Laboratories, Albany, Nov. 1. Miss Mary B. Kirkbride, New Scotland Avenue, Albany, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 28-Nov. 1. Dr. J. D. McCarthy, 107 South 17th St., Omaha, Secretary.

Pacific Coast Society of Obstetrics and Gynecology, San Francisco, Nov. 6-9. Dr. T. Floyd Bell, 400 Twenty-Ninth St., Oakland, Calif., Secretary.

Radiological Society of North America, Cleveland, Dec. 2-6. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Southern Medical Association, Louisville, Ky., Nov. 12-15. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southwestern Medical Association, Tucson, Ariz., Nov. 21-23. Dr. M. P. Spearman, 1001 First National Bank Bldg., El Paso, Texas, Secretary.

Western Surgical Association, Topeka, Kan., Dec. 6-7. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

20:129-260 (Aug.) 1940

Esophageal Pulse Under Normal and Abnormal Conditions. A. C. Taquini, Buenos Aires, Argentina.—p. 129.
*Prodromal Pain in Coronary Occlusion. B. Blumenthal and J. A. Reisinger, Washington, D. C.—p. 141.
Simultaneous Mechanograms and Electrograms from Intact Human Subject, with Notes on Effects of Distention of Stomach on Conventional Electrocardiogram: Preliminary Report. C. A. Johnson and G. H. Laing, Chicago.—p. 160.
Predominance of Surface Over Deep Cardiac Injury in Producing Changes in Electrocardiogram. B. Kisch, L. H. Nahum and H. E. Hoff, New Haven, Conn.—p. 174.
Relation Between Bundle Branch Block and Cardiac Enlargement. A. M. Master, H. Kalter, S. Dack and H. L. Jaffe, New York.—p. 186.
Examination of Heart and Lungs by Cardiocairographic Method. I. S. Hirsch, New York.—p. 195.
Effect of Aminophylline on Peripheral Blood Flow. H. J. Stewart and N. B. Jack, New York.—p. 205.
Dissecting Aneurysm: Report of Nineteen Cases, with Review of Recent American Literature. L. F. Holland, Austin, Texas, and R. H. Bayley, New Orleans.—p. 223.

Prodromal Pain in Coronary Occlusion. — Blumenthal and Reisinger discuss the prodromal pain that occurred spontaneously, without obvious cause, and always preceded definite manifestations of coronary occlusion. Histories of thirty-two patients revealed that twelve had experienced such attacks for varying periods before the severe manifestations recognized as coronary occlusion occurred. Nine of the thirty-two patients died, one of whom was in the "prodromal" group. The mechanism of the production of the "prodromal" pain in this case is discussed in the light of pathologic anatomy. The duration, character and length of the prodromal period of pain varied from patient to patient. Generally the attack appeared suddenly, without obvious precipitating causes, when the patient was apparently in good health. The pain usually developed while the patient was at rest. The attacks of five patients were associated with exertion, but in these instances the pain either was not relieved by cessation of the exercise or began after the exercise was stopped. Nine patients were able to do fairly strenuous work without discomfort on the same day on which they had spontaneous attacks of pain. One patient had attacks of angina of effort which were relieved promptly by rest, but he also had other pain which he himself differentiated from angina of effort, which was not associated with exercise, emotional excitement or eating. The pain varied in duration from fifteen minutes to hours and from a mild ache to extreme severity. It was variously described as burning, gnawing, constricting, toothache-like, gripping, aching, swelling, and crushing. The character of the pain remained constant during the prodromal period, but its severity, duration and area involved increased with succeeding attacks. Usually the pain was referred to the anterior chest wall between the midclavicular lines. Ultimately it was always located in this area. The pain of three patients did not involve the chest primarily; severe aching and weakness of the left arm, intermittent pain in both shoulders for a week before the coronary occlusion and pain in the left elbow for six days preceded the onset of pain in the chest. One patient had had pain in the left shoulder for three years. Pain and extreme weakness in one or both upper extremities associated with the premonitory manifestations were noticed by six patients. Subsequent events indicated that the peripheral pain and weakness were related to the changes in the heart and coronary arteries. Between prodromal attacks the patients felt well, except for transient weakness. Four patients were examined between attacks and no signs of myocardial infarction were found. Electrocardiograms of three patients showed no changes typical of coronary occlusion. The authors discuss the mechanisms that may be responsible for prodromal pain. They believe that of the many factors which contribute to it intramural hemorrhage may be an important one.

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Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

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Physical Differences Between Types of Penetrating Radiation. A. H. Compton, Chicago.—p. 270.
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Roentgenography and Duodenal Drainage in Cholelithiasis.—Levyn and Meyers compared the relative value of x-rays and examination of the duodenal contents in the diagnosis of cholelithiasis in fifty-four cases. The diagnoses were verified by surgical exploration and pathologic examination. Some of the patients were suffering from other diseases, such as hepatic or gastric carcinoma, peptic ulcer, pancreatitis and postoperative adhesions. Cholecystographic examinations were conducted by the oral method, tetraiodophenolphthalein being administered in 4 Gm. doses. Duodenal drainage was performed according to the method of Lyon. The bile obtained from the duodenum was examined microscopically after being centrifuged for pigment and crystals, the presence of which is indicative of stones in the gallbladder and biliary ducts, and for the amount of B bile present. When from 30 to 50 cc. of B bile was obtained the function of the gallbladder was considered normal and conclusions were drawn as to the presence or absence of stones in the gallbladder. When B bile is absent or only a slight trace is recovered after repeated drainage it may be impossible to determine the presence or absence of gallstones. Occasionally pigment and crystals may be found

in the absence of B bile. This is considered indicative of intraductal stones or biliary stasis. The finding of cholesterol crystals or calcium bilirubinate pigment, or both, in the same sediment was considered as evidence of calculi in the biliary tract. The fifty-four cases were divided into two groups: the thirty-three in which gallstones were found and the twenty-one in which gallstones were not found at operation or necropsy. In those cases in which gallstones were found, a positive diagnosis was made roentgenographically by actual demonstration of their shadows in fifteen. Suggestive, but not positive, evidence was observed in three additional cases. The primary films made the positive diagnosis of cholelithiasis in the majority of cases, and cholecystography helped to establish definite evidence of shadows in only three cases, when they were absent on the primary films. The diagnosis of calculi by means of duodenal drainage was positive in twenty-eight of the thirty-three cases. Therefore the positive identification of stone shadows, when present, was accomplished by x-ray examination in 45.5 per cent, while duodenal drainage gave such evidence in 85 per cent. Both methods gave no positive evidence of calculi in three of the thirty-three cases. In no instance of the other group of cases did cholecystography reveal stone shadows, while duodenal drainage indicated gallstones in seven cases when they were not present. The presence of pigment and crystals in individuals without gallstones has been previously reported by Bockus and his co-workers. In five cases, after surgical exploration of the biliary tract and microscopic study of the wall of the gallbladder there was no accountable reason for the presence of pigment and crystals in the duodenal contents. In one the precipitation of pigment could have been explained by the fact that the patient was deeply jaundiced and in another by severe cholecystic disease without stones.

Deleterious Pulmonary Effects of High Voltage Roentgen Irradiation.—Jacobsen records a postmortem study of the case of a man with a clinical diagnosis of cancer of the lung who was subjected to high voltage roentgen therapy over a period of nine years and whose death was undoubtedly the result of the therapy and not of the neoplasm. During the nine years about 15,800 roentgens was given to the right chest. X-ray evidence during this long interval was compatible with cancer of the right lung. There was no significant loss of weight and little evidence of anemia. Frequent roentgenograms showed slowly progressive fibrosis of the right lung, thickening of the pleura, marked elevation and fixation of the diaphragm, narrowing of the intercostal spaces and retraction of the mediastinal structures to the affected side. This syndrome, following prolonged high voltage irradiation, is almost pathognomonic of roentgen pleuropulmonitis. The conversion of lung into scar tissue increased the vascularity of the bronchial lining. This led to frequent hemoptysis, often of alarming proportions. Irradiation aided in stopping these hemorrhages and was often used for this purpose. Thus a vicious circle was established. Death occurred from an acute influenza-like pneumonia sixteen years after his first symptoms, with secondary septicemia and kidney abscesses. Necropsy revealed the right lung to be converted into a structure of fibrous consistency the size of a man's fist. The pleura was about 4 mm. thick and of almost cartilaginous hardness. Atelectasis was present wherever there was enough lung structure for this to occur. Embedded in a dense mass of fibrous tissue just outside the hilus was an epithelial tumor 2 cm. in diameter with a necrotic center and a viable periphery. The diagnosis was therefore correct and the treatment was successful in that it destroyed most of the tumor and held the small remnant in subjection. Just how much of the vascular pulmonary damage was due directly to roentgen irradiation is open to conjecture. The cellular structure of the lung places it in the group of less radiosensitive organs. With the high voltages and deep penetrability of modern x-ray equipment, destruction or inhibition of tumors in the chest is being accomplished, but at the same time changes in the non-tumor containing portions of the irradiated lung are being detected. Generally these are of minor clinical import but many reports are accumulating which indicate a danger which must be appreciated and guarded against. The widespread alteration in pulmonary tissue, of a kind that greatly decreases pulmonary volume, doubles the work of the opposite lung and increases the chances of infection. An increase in such complications is prophesied unless improvements in radiation technic are forthcoming. Before a roentgenologist gives additional roentgen therapy to a patient, it is mandatory that he be in possession of facts concerning all previous exposures. Neglect in obtaining such information may in the future lay the physician open to the charge of lack of due care.

American Review of Tuberculosis, New York

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Case Finding with Fluoroscopic Roentgenography. E. Bridge, Rochester, N. Y.—p. 155.
Mental and Nervous Phenomena in Tuberculosis. E. F. Conlogue, Auberry, Calif.—p. 161.
Bronchial Asthma and Pulmonary Tuberculosis. E. Urbach and A. Loew, Philadelphia.—p. 174.
*Pleural Effusion in Pneumothorax. R. T. Eng, Fort San, Sask.—p. 183.
Tuberculin Reactions: Comparison of Reactions to Standard and Increased Initial Doses of Tuberculin. L. R. Jones, Philadelphia.—p. 191.
Tuberculosis on Small Thickly Populated Indian Reservation. L. R. Jones, Philadelphia.—p. 197.
*Tuberculin Tests and Roentgenograms: Correlation on 1,000 Adults. P. D. Crimm, W. L. Potts and Gwen S. Hudson, Evansville, Ind.—p. 203.
Tuberculin Tests: Qualitative Reactions with Intermediate Strength of Purified Protein Derivative in 1,000 Adults. P. D. Crimm, Gwen S. Hudson and P. A. Bunn, Evansville, Ind.—p. 209.
Tuberculosis Mortality and Industrialization, with Special Reference to the United States: Part II. G. Wolff, Baltimore.—p. 214.
Fatality Rates for Reported Cases of Tuberculosis. G. E. Harmon, Detroit.—p. 243.
Toll of Tuberculous Infection. E. Bogen, Olive View, Calif.—p. 253.
Experimental Tuberculosis in Dog: I. Cutaneous Sensitivity to Tuberculin in Dog. Charlotte A. Colwell and M. A. Mills, Chicago.—p. 259.
Id.: II. Comparison of Old Tuberculin and Purified Protein Derivative in Intracutaneous Tests. Charlotte A. Colwell and M. A. Mills, Chicago.—p. 271.
Tuberculous Cavities: Their Location and Prognostic Significance. R. Charr, J. W. Savacool and B. Gordon, Philadelphia.—p. 277.

Pleural Effusion in Pneumothorax.—Eng states that of 394 consecutive pneumothorax cases 269, or 68.3 per cent, formed fluid which remained a week or more. This was observed on fluoroscopic examinations performed at intervals of from three to fourteen days. The fluid formed within the first three months in 50.5 per cent, within six months in 67.1 per cent and within a year in 85.6 per cent. The incidence of fluid was greatest in far advanced cases, less in the moderately advanced and least in the minimal. Therefore a great number of effusion cases can be safely avoided by establishing pneumothorax in early lesions. Of the forty-nine deaths in the cases under consideration, fluid developed in forty and only two of these did not show far advanced lesions. Empyema developed in forty-nine of the 134 cases in which aspiration was done. The empyemas of twenty-one cases were aspirated and irrigated with physiologic solution of sodium chloride until the fluid withdrawn was clear and then from 10 to 50 cc. of azochloramid 1:3,300 or the same amount of azochloramid in triacetin 1:500 was injected. Aspirations were done at weekly intervals. The twenty-one patients tolerated the former solution well, having no reaction most of the time or but a mild degree of pain and fever for from a few hours to one day following the injection, whereas the four patients given the latter solution had either a marked elevation of temperature or considerable pain and showed no improvement after six or more treatments. With the 1:3,300 solution the pus gradually became thinner, less in quantity and finally either disappeared entirely or was replaced by a small amount of clear straw colored fluid in eighteen cases. Constitutional improvement occurred, the toxic symptoms of empyema disappeared and appetite and weight increased gradually.

Tuberculin Tests and Roentgenograms.—Crimm and his colleagues state that 1,000 adults of native stock from 16 to 70 years of age were divided into two groups and given intracutaneous tuberculin purified protein derivative tests. Roentgenograms were made of reactors and nonreactors alike. The first group of 553 individuals were given 0.00002 mg. of purified protein derivative intracutaneously; 429 of the 553 were negative to this dose at forty-eight hours and were then given 0.001 mg. of purified protein derivative. The second group of 447 individuals were tested simultaneously in one arm with

0.00002 mg. of purified protein derivative and in the other with 0.001 mg. The incidence of contact cases was 13.6 per cent; 76.7 per cent of all the cases showed evidence of previous tuberculous infection either by the tuberculin test and/or by the roentgenogram. Two active cases were found in the entire series. Of the total cases showing evidence of tuberculosis, 72.1 per cent were found by the tuberculin test and 69.9 per cent through x-ray study. If only the tuberculin test had been employed the incidence of infection would have been 55.3 per cent, and if the x-ray examination had been the only procedure it would have been 53.5 per cent. However, since only two active cases were found, the experiment shows that mass examination by the tuberculin test and x-ray study of the adult is quite expensive in this locality. One of the active cases could have been found through adequate follow-up work because of a history of contact. The other person consulted a physician two weeks prior to the test and would ultimately have been admitted to a sanatorium. Therefore this method of case finding is too expensive for the results it gave. As follow-up work on discharged patients from sanatoriums, the recording of all patients and contacts with state boards of health, the isolation and quarantine of open cases by health officials and earlier diagnosis on the part of the medical profession, together with education of the public, are necessary in a complete case-finding program, the authors believe that efforts should be centered on these projects rather than on mass x-ray examination and mass tuberculin testing. Tuberculin testing of special groups is valuable as an educational program, even though its case-finding efficiency is limited.

Archives of Neurology and Psychiatry, Chicago

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Vascularization and Vulnerability of Cornu Ammonis in Opossum. E. Scharrer, New York.—p. 483.
Constitutional Differences Between Deteriorated and Nondeteriorated Patients with Epilepsy: IV. Handwriting. H. A. Paskind and M. Brown, Chicago.—p. 507.
Action Potentials of Muscles in Athetosis and Sydenham's Chorea. P. F. A. Hoefer and T. J. Putnam, New York.—p. 517.
*Spontaneous Cerebral Ventriculostium. W. H. Sweet, Chicago.—p. 532.
One Hundred Cases of a Condition Diagnosed as Acute Encephalitis: Clinicopathologic Study. Alexandra Adler, Boston.—p. 541.
*Comparative Study of Metrazol Treatment and Control Observations of Schizophrenia. J. Notkin, F. J. DeNatale, C. E. Niles and G. Wittman, Poughkeepsie, N. Y.—p. 568.
Spastic Pseudosclerosis (Disseminated Encephalomyelopathy; Corticopallidospinal Degeneration): Familial and Nonfamilial Incidence: Clinicopathologic Study. C. Davison and A. M. Rabiner, New York.—p. 578.
Myeloradiculoneuritis with Cell-Protein Dissociation. D. Shaskan, H. A. Teitelbaum and L. D. Stevenson, New York.—p. 599.
Vestibular Reactivity in Schizophrenia. A. Angyal and N. Blackman, Worcester, Mass.—p. 611.
Physiologic Aspects of Schizophrenic Withdrawal. A. Angyal, H. Freeman and R. G. Hoskins, Worcester, Mass.—p. 621.
Subarachnoid and Intracranial Hemorrhages Due to Metrazol. H. N. Roback and C. W. Miller Jr., Medical Lake, Wash.—p. 627.
Defective Closure of Neural Tube: Case of Involvement of Central Olfactory, Trigeminal Mesencephalic, Visual Reflex, Auditory and Cerebellar Systems. H. S. Rubinstein, Baltimore, and W. Freeman, Washington, D. C.—p. 636.

Spontaneous Cerebral Ventriculostium.—Sweet reports two instances of spontaneous development of an opening between the third ventricle or the lateral ventricles and the external surface of the brain. Such openings develop as a consequence of expansion of the cerebral ventricles when the flow of cerebrospinal fluid is obstructed. In the only other case reported in the literature the obstruction took place at the aqueduct of Sylvius. In the author's second case the block was at the same site, and in his first case the obstruction was due to an enormous teratoid tumor in the posterior cranial fossa. The first patient, a woman of 54, was admitted to the hospital in an extremely confused mental state. She dated all her symptoms to two days previously. A history of symptoms beginning twelve years previously was obtained from her family and her physician. A diagnosis of probable right cerebral glioma was made and the patient was discharged. Within a few weeks the defects in her memory and gait had practically disappeared and she was apparently well for nine years, when she was found unconscious on the sidewalk. Despite the unusual history, the marked cerebellar signs and calcification strongly suggested a neoplasm, but pneumo-encephalographic examination or suboccipital exploration was not carried out because of the patient's poor general condition. She also presented hypertension, bronchopneumonia and pyuria; acute pulmonary edema and hyperpyrexia developed four days after entry, and the patient died the next day. Necropsy revealed a midline cerebellar teratoid tumor with moderate secondary hydrocephalus and rupture through the lamina terminalis. The author believes that the complete subsidence of symptoms for nine years is probably to be correlated with the abnormal opening in the lamina terminalis. It was unlikely that this was an artefact. The possibility that the subsidence of the symptoms was due to spontaneous rupture of the cystic tumor is not tenable, as there was no evidence of cystic contents in the subarachnoid space. Also the tumor was multilocular, and it is unlikely that enough locules would have broken simultaneously to cause all symptoms to disappear. The author believes that the nine years of freedom from symptoms was due to the spontaneous development of a third ventriculostium. This favors the similar operative procedure recommended by Dandy and by Stookey and Scarff for relief of hydrocephalus from occlusion of the aqueduct of Sylvius. The ventriculostium continued patent and functioning for nine years and was apparently still effective at the time of death. In the other case, in a boy of 15, in which there was a spontaneous ventriculostium, the hydrocephalus was not relieved as no communication was established with the subarachnoid space. Because of marked involvement of the posterior cranial nerves and cerebellar seizures and signs, the clinical diagnosis was between a cerebellar and a metencephalic tumor. Postmortem study was restricted to the brain, and the primary source was found to be a tumor of the brain stem. A conspicuous nodule of it lay in the midline of the tectum of the midbrain, between the superior colliculi and occluding the rostral portion of the aqueduct of Sylvius. The signs of involvement of the structures in the posterior fossa were due not only to their invasion by the tumor but to the fact that they were not given the usual protection by the tentorium cerebelli; there was in effect a large fluid tumor in the upper part of the posterior fossa. The widely dilated pupils which gave no reaction to direct light constituted the only sign of destruction of tissue in the tectum mesencephali by the tumor. The boy's obesity and retardation of sexual maturity were ascribed to secondary pressure on the hypothalamus and pituitary gland with the resultant atrophy. The extensive destruction of nerve tissue precluded any attempt to localize the site of origin of terminal cardiovascular attacks.

Comparison of Metrazol and Control Treatment of Schizophrenia.—Notkin and his co-workers present the results obtained in schizophrenic patients treated with metrazol and those given injections of physiologic solution of sodium chloride. The control patients were kept in bed in the same ward with the patients treated with metrazol. The study is based on the treatment of fifty men and fifty women with metrazol, thirty-four men and thirty-seven women controls and twelve men and three women who recovered or improved while awaiting treatment. The duration of the psychosis was more than eighteen months in 78 per cent of patients in the treated group, in 84.5 per cent of the control group and in only 13.4 per cent of the patients who improved spontaneously. The patients were followed for from six months to one and a half years after the termination of treatment or control observation. Of the 100 treated patients, 18 per cent showed various degrees of improvement. One man died of an abscess of the lung which developed after the thirteenth convulsion. The remaining eighty-one patients failed to show any change in their mental condition. Of the patients who improved, seventeen were released and two have had relapses and were returned to the hospital. Of the seventy-one control patients, six (8.4 per cent) showed various degrees of improvement and sixty-five failed to improve. Five of these improved patients were discharged and two have had relapses and have been returned to the hospital. Of the fifteen patients who improved spontaneously, one had a relapse while still in the hospital and two others have had relapses after their release. None of the treated or the control patients recovered. Recoveries occurred in 14.3 per cent of the patients showing spontaneous improvement. Patients with a shorter duration of the psychosis had

longer remissions. The patients in both groups who improved were younger than the patients who did not improve. The convulsive threshold was lower in women. The paranoid and the catatonic types of psychoses were equally represented in the improved treated patients, while in the control group the catatonic type predominated. The paranoid type predominated in both groups of unimproved patients, as it did in the group who improved spontaneously. All patients who improved showed a gain in weight. From one to seven temporomandibular dislocations during convulsions were encountered among fourteen patients. An incomplete fracture of the femur and a dislocation of the humerus occurred in two other patients. A transitory rise of blood pressure and an increase in pulse rate followed all convulsions.

Archives of Surgery, Chicago

41:569-812 (Sept.) 1940

Effect of Cholecystogastrostomy on Cinchophen-Produced Ulcer in Dogs. H. Swan, Denver.—p. 569.
Metabolism of Vitamin K and Role of Liver in Production of Prothrombin in Animals. J. W. Lord Jr., W. D. Andrus and R. A. Moore, New York.—p. 585.
*Clinical Investigations of Some Factors Causing Prothrombin Deficiencies: Significance of Liver in Their Production and Correction. W. D. Andrus and J. W. Lord Jr., New York.—p. 596.
Influence of Fusion of Spine on Growth of Vertebrae. S. L. Haas, San Francisco.—p. 607.
Extensive Plexiform Neurofibromatosis of Scalp and Pinna. R. Meyers, Brooklyn.—p. 625.
Leiomyoma of Round Ligament. C. W. Mayo and G. B. Schunke, Rochester, Minn.—p. 637.
Ectopic Pregnancy: Its Relation to Diagnostic Problems of General Surgeon. G. Zechel, Chicago.—p. 646.
Carcinoma of Extrahepatic Bile Ducts. H. L. Stewart, Bethesda, Md.; M. M. Lieber and D. R. Morgan, Philadelphia.—p. 662.
*Metaplasia in Breast. R. L. Oliver, Savannah, Ga.—p. 714.
Serum Proteins and Wound Healing. H. Koster and A. Shapiro, Brooklyn.—p. 723.
*Fuchs Test for Malignancy. C. S. Robinson, R. Evers and A. Truex, Nashville, Tenn.—p. 730.
Bacillus Pyocyaneus Osteomyelitis of Spine: Report of Case of Successful Treatment with Sulfanilamide. A. J. Schein, New York.—p. 740.
Incomplete Indirect Inguinal Hernias: Study of 2,462 Hernias and 2,337 Hernia Repairs. H. J. Shelley, Fort Worth, Texas.—p. 747.
Cerebral Complications Following Surgical Operations: II. Factors Which Predispose to Cerebral Anoxia. A. Behrend and Helena E. Riggs, Philadelphia.—p. 772.
Preoperative Diagnosis of Torsion of Pedicle of Spleen: Report of Case with Splenectomy Followed by Recovery. C. Romiti, Georgetown, British Guiana.—p. 781.
Seventy-Second Report of Progress in Orthopedic Surgery. J. G. Kuhns, R. J. Joplin, W. A. Elliston, G. Bailey, J. A. Reidy, Boston; J. E. Milgram, New York; F. E. Ilfeld, Los Angeles, and R. Perlman, Cincinnati.—p. 788.

Factors Causing Prothrombin Deficiencies.—Andrus and Lord studied the plasma prothrombin levels in two groups of cases with disorders of the biliary tract and other conditions associated with deficiencies in the clotting component. In the first series twenty-two patients were found to have low prothrombin levels and were treated with vitamin K (klotogen or cerophyl) and bile salts (bilron). With this therapy and transfusions for some of the patients, hemorrhage ceased when it was present at admission or its subsequent occurrence was prevented except in one patient who died. This patient had a carcinoma involving the bile passages and died from a massive hemorrhage from an ulcer on the posterior aspect of the duodenum which had eroded into the pancreaticoduodenal artery. This patient's prothrombin level had previously been low but had responded to treatment and at the time of the hemorrhage was normal. Quite obviously the bleeding was unconnected with any prothrombin deficiency. Since October 1939 the authors have used the synthetic vitamin K, 2-methyl-1, 4-naphthoquinone, intramuscularly for thirty-eight cases with prothrombin deficiencies, with strikingly successful results in the absence of damage to the liver. When it is given by injection, the presence of bile salts in the intestinal tract is not necessary for its absorption, and its effect is evident within a few hours. The clinical effectiveness of vitamin K may be diminished or even abolished in the presence of severe hepatic damage. Two cases are cited to illustrate the influence of hepatic damage on the level of plasma prothrombin and on the response to vitamin K. One was a case of thrombosis of the hepatic artery and the other of marked cirrhosis. Vitamin K medication had no effect here on the prothrombin level.

Metaplasia of Breast.—Comprehensive review of the literature, according to Oliver, revealed no reference to pavement epithelium of primary origin in the mammary gland. He reports three such cases and reviews the physiology of the breast and abnormalities associated with faulty cyclic processes described by Oliver and Major as cyclomastopathy. The pavement type of epithelium in the three cases was deeply embedded in growths of cyclomastopathic origin and could not have been the result of the growing over of surface epithelium, which must be ruled out in all cases of suspected metaplastic processes. The presence of pavement epithelium in such a growth bears out the contention that mechanical stimuli may aid in inaugurating metaplastic processes. Whether embryonal displacement, simple retrogression or direct metaplasia is responsible for the change is a theoretical question. The fact that the change has taken place and is associated with changes similar to metaplasia must be considered. The variation from the glandular to the pavement type of cell indicates that the process is an indirect one, transitional changes being necessary for the transformation, as against the direct process, in which a specialized cell or tissue is changed into another specific cell or tissue without intermediate stages. Such an abrupt change was not seen in any of the sections. The author's views on the possible mechanisms by which metaplasia and its associated processes may be brought about are: 1. In consideration of the derivation of metaplastic processes from a germinal cell or tissue, certain cells of the original germinal stock from which the specialized cell or tissue is derived may remain undifferentiated, though in their development they are carried along with the differentiated cells. 2. In the growth of cells or a tissue toward a certain specialization, there is a possibility that some cells may be retarded in their differentiation and may remain so, as do the completely undifferentiated cells in the specialized tissue. These cells may also develop along lines foreign to the site and thus appear different from those of the tissue considered. 3. The transformation of one specialized cell or tissue into another different specialized cell or tissue is doubtful and rarely, if ever, occurs in a direct manner, although the possibility must be considered.

Fuchs Test for Cancer.—Robinson and his associates employed the Fuchs test in 200 cases for the diagnosis of malignant conditions. They obtained seventy-four negative reactions in cases in which evidence of a malignant process was not to be found. The presence of a malignant tumor was suspected among ten but the growth was proved on biopsy to be benign. There were a number of negative values corresponding to Fuchs's "immune reaction," most of which were too small to be significant. In fifty-six cases of proved malignant tumor the Fuchs reaction was positive. The interest of the test lies in the wide variety of tumors which give positive reactions. The test gave negative reactions in some patients who either had or had previously had proved malignant tumors. The majority of these patients had undergone some therapy, after which the tumor showed no signs of recurrence. If it is assumed that the Fuchs reaction would have been positive prior to treatment, the effects of therapy are rather prompt. In one instance (sarcoma of the jaw) a negative reaction was obtained as soon as six days after operation, while in another case (squamous carcinoma of cervix) it was not negative until eight months after operation and high voltage roentgen therapy. At the time the test was negative and one week later this patient was much improved. That the test measures the activity of the malignant growth is indicated by a case of carcinoma of the breast. On admission the patient was found to have extensive carcinomatosis with metastases to the bones and other structures. At this time her blood gave a positive Fuchs reaction. She was pregnant and was delivered by cesarean section. No treatment was given for the malignant tumor. Two months later her blood gave a negative reaction. At this time she was much improved; she had gained weight and there was marked retrogression of her osseous lesions. However, several months later she died. There were twenty-seven patients whose blood gave negative reactions. These patients were cured, were under treatment or had lesions in the early stages of growth. There were also eighteen cases for which no explanation appears and the results of the Fuchs test must be assumed to be genuine false negative reactions. Five posi-

tive Fuchs reactions were obtained in spite of the fact that pathologists failed to find malignant tissue. The authors present data on thirteen cases in which no microscopic examination was made. Their experience has not confirmed that of other investigators that false negative reactions are seldom obtained but that false positive reactions may be obtained in a number of conditions, notably syphilis and tuberculosis. They feel that the accuracy of the method could be increased by improving the quality of the substrate and by frequent checking of its activity. The limitations of the test are that: 1. The growth must be more than six months old. 2. The patient should not have been operated on or have received radium or roentgen treatment for at least a month. 3. The tumor must be in a period of active growth.

Arkansas Medical Society Journal, Fort Smith

37:75-92 (Sept.) 1940

Tuberculin Patch Test: Comparative Study of Vollmer Patch Test and Mantoux in 200 Cases. R. E. Weddington and W. O. Arnold, Fort Smith.—p. 75.
Reciprocal Relations of Ophthalmologist and General Practitioner. M. Wiener, St. Louis.—p. 78.

Canadian Public Health Journal, Toronto

31:357-406 (Aug.) 1940

Preventive Medicine in General Practice. G. Fleming, Montreal.—p. 357.
*Vaccination Against Tuberculosis with BCG Vaccine. J. A. Baudouin, Montreal.—p. 362.
Pioneers in Tuberculosis Work in Canada. G. D. Porter, Toronto.—p. 367.
Active Immunization by Intranasal Route: Comparison of Various Haemophilus Pertussis Antigens. Ruth P. Dow, Montreal.—p. 370.
Antitoxin Response to Concentrated Diphtheria Toxoid Applied to Nasal Mucous Membrane. D. T. Fraser, E. L. Davey and K. C. Halpern, Toronto.—p. 376.
Social Work with Boys. K. H. Rogers, Toronto.—p. 381.

BCG Vaccination Against Tuberculosis.—Baudouin summarizes the eleventh annual report of the subcommittee on tuberculosis of the National Research Council dealing with the value of the BCG vaccine against tuberculosis. The report is based on 20,000 vaccinations accumulated during eleven years. Appraisal of the immunity conferred by the Calmette-Guérin vaccine considered the comparative mortality and morbidity figures observed in 725 vaccinated (ages from under 12 months to 13 years) and 1,178 unvaccinated children all living in contact with sputum-positive persons and indicated a 51 per cent total mortality balance in favor of the vaccinated group and a favorable morbidity rate of 47 per cent. Judged by the duration of the immunity conferred, vaccinated children were found to possess a greater resistance to tuberculosis than the unvaccinated: for children under 12 months by 71 per cent, from 1 to 2 years by 54 per cent, from 2 to 3 years by 86 per cent, from 3 to 4 years by 66 per cent and from 4 to 5 years by 33 per cent. The decline in mortality, though regularly favoring the vaccinated group, was not as uniform as was expected. This is attributed to the small number of deaths in both groups (eleven and fifty-eight respectively). Among 9,000 vaccinated children born into or living in families free from tuberculosis and ranging up to 13 years of age, no negative reactions occurred. None of the 275 deaths that occurred among them were due to tuberculosis. The report recommends BCG vaccination for all children, especially for those born into a contaminated environment. Infants were always vaccinated during the first ten days after birth. Protection against tuberculosis afforded by the vaccine is stated to last for two or more years.

Florida Medical Association Journal, Jacksonville

27:57-112 (Aug.) 1940

The Medical Man and the Florida Workmen's Compensation Act (1935). E. L. Scott, Ocala.—p. 69.
Impetigo Contagiosa Complicated by Hemorrhagic Nephritis: Case Report. H. E. Palmer, Tallahassee.—p. 73.
Spontaneous Hemorrhage of Ovary. J. S. Turberville, Century.—p. 75.
Endocrinology of Menstruation: Review of Recent Literature. L. W. Dowlen, Miami.—p. 79.
Emergency Procedures in General Practice. R. Britt, St. Augustine.—p. 84.
Garlic: Occupational Factor in Etiology of Bronchial Asthma: Case Report. G. E. Henson, Jacksonville.—p. 86.
Eugenic Sterilization in Florida. Lydia Allen DeVilbiss, Miami.—p. 87.
Low Back Pain: Backalgia. E. L. Jewett, Orlando.—p. 89.

Georgia Medical Association Journal, Atlanta

29:385-430 (Aug.) 1940

Crawford Williamson Long. J. A. Farley, Washington, D. C.—p. 385.
Dr. Crawford W. Long: Pioneer in Medical Research. W. H. Myers, Savannah.—p. 388.
Medical Horizons. J. K. Quattlebaum, Savannah.—p. 390.
Salyrgan-Theophylline by Mouth: Report of One Case. L. M. Blackford, Atlanta.—p. 397.
Use of Salyrgan-Theophylline Suppositories in Congestive Heart Failure. T. S. Claiborne and R. B. Logue, Atlanta.—p. 399.
Prevention of Infection by Air-Borne Bacteria of Operative Wounds. D. Hart and R. Jones Jr., Durham, N. C.—p. 401.
Tuberculosis of Bladder. S. T. Brown, S. R. Brown and F. B. Hodges, Atlanta.—p. 405.
Hyperactive Carotid Sinus Reflex: Report of Case. R. F. Slaughter, Augusta.—p. 408.
Congenital Preauricular Fistula. J. D. Martin Jr., Atlanta.—p. 411.
Treatment of Summer Diarrhea in Infants: Preliminary Report. H. E. Teasley, Hartwell.—p. 413.

Journal of Immunology, Baltimore

39:89-170 (Aug.) 1940. **Partial Index**

In Vitro Anaphylaxis in Surviving Intestine. P. A. Nicoll and D. H. Campbell, Chicago.—p. 89.
Studies on In Vitro Anaphylaxis and Release of Active Nonhistamine Material from Sensitized Guinea Pig Lung. D. H. Campbell and P. A. Nicoll, Chicago.—p. 103.
Studies with Clostridium Chauvoei (Blackleg) Aggressin. I. Live, Philadelphia.—p. 137.
Studies on Antipneumococcus Rabbit Serum: II. Relation Between Mouse-Protective Units and Precipitin Nitrogen. T. D. Gerlough, J. W. Palmer and R. R. Blumenthal, New Brunswick, N. J.—p. 163.

Journal of Investigative Dermatology, Baltimore

3:251-346 (Aug.) 1940

Changing Causal Concepts and Investigative Methods. J. H. Stokes, Philadelphia.—p. 257.
Attempts to Prove Specificity of Streptococci Isolated from Nasopharynx of Patients with Psoriasis. R. R. Kierland, Rochester, Minn.—p. 273.
Sensitivity to Rat Hair. A. Romanoff, New York.—p. 287.
*Tattooing (Puncturation) with Mercury Sulfide and Other Chemicals for Treatment of Pruritus Ani and Perinei: Further Investigations. R. Turell, New York.—p. 289.
Experiments with Histaminase. F. A. Simon, Louisville, Ky.—p. 299.
Acne Vulgaris: Failure to Demonstrate a Relation to Staphylococcic Infection. F. W. Lynch, Minneapolis.—p. 305.
Nutritional Approach to Experimental Dermatology: Introduction and Review of Literature. M. Sullivan and Jane Nicholls, Baltimore.—p. 309.
Id.: Nutritional Dermatoses in the Rat: I. Vitamin B_6 Deficiency. M. Sullivan and Jane Nicholls, Baltimore.—p. 317.
Id.: II. Skin Changes in Rats Deficient in Entire Vitamin B Complex Other Than Thiamine. M. Sullivan and Jane Nicholls, Baltimore.—p. 337.

Tattooing for Pruritus Ani and Perinei.—Turell points out that the rationale of therapeutic tattooing with mercuric sulfide is still undetermined but that the mechanical trauma produced by tattooing without the use of mercuric sulfide is ineffectual for the permanent control of pruritus ani. His experience with thirty-seven cases warrants the extension of this treatment. At present he tattoos not only those patients with intractable pruritus ani of long standing who failed to respond to established therapeutic measures but also patients who have pruritus ani that is recalcitrant to treatment regardless of the duration of the lesion and the few so-called psychoneurotic patients with cutaneous perianal changes consistent with pruritus ani. Selection of patients is important, as results show that tattooing with mercuric sulfide is apparently ineffective for pruritus that is primary in the perineum and posterior vulva but effective in those cases in which there was a spread of the pruritus from the posterior to the anterior perianal areas involving the perineum and the posterior portion of the vulva. The treatment has thus far proved of little value for pruritus vulvae either of undetermined origin or with superimposed dermatitis. Tattooing with mercuric sulfide is done in the presence of inflammatory and infectious disease of the preformed anal ducts, anal glands and the crypts of Morgagni. All anal lesions are always eradicated prior to tattooing. Redundant perianal skin, even in the absence of anal lesions, is removed to facilitate tattooing. Operation and tattooing are never done at one sitting because the primary operation may control the pruritus and because in the presence of open wounds the mercuric sulfide may get into the subcutaneous tissues and form mercuric proteinate, which is toxic because it is gradually absorbed. Among the

thirty-seven cases treated there were three cases of recurrence following tattooing but in no instance was the recurrent anal pruritus as intense as the original. In one of these there was also present a transient bilateral scaly dermatitis in the tattooed perianal region and an intermittent bilateral irritation caused by oil or grease laden clothes. These two factors were bilateral in distribution and, as the recurrent pruritus was unilateral, the author believes that an insufficient deposit of mercuric sulfide in the skin may have been responsible for the recurrence. The itching was very mild and inconsequential in character in the two other patients and treatment directed to the associated or underlying anal lesions (excision of an infected crypt and topical medication of a fissure) caused the pruritus to disappear. Studies now in progress appear to show that a pharmacodynamic degenerative effect on the cutaneous terminal nerve supply is produced by tattooing with mercuric sulfide which alters the capacity of the terminal nerve network to respond to adequate stimuli. The author believes that a critical attitude should be maintained until a large series of treated cases have been observed for a long time.

Journal of Pediatrics, St. Louis

17:143-278 (Aug.) 1940

Glucose Tolerance Test in Celiac Disease: Significance of Low Blood Sugar Curves. C. D. May and J. F. McCreary, Boston.—p. 143.

Primary Carcinoma of Liver, with Banti's Syndrome. Vida B. Wentz and K. Kato, Chicago.—p. 155.

*Involvement of Nervous System in Sickle Cell Anemia. J. G. Hughes, L. W. Diggs and C. E. Gillespie, Memphis, Tenn.—p. 166.

Phlyctenular Conjunctivitis: Quantitative Details of Desensitizing Treatment in Sixteen Children. P. J. Howard, Detroit.—p. 185.

Sporotrichosis: Report of Case. D. H. Fogel and D. W. Martin, Durham, N. C.—p. 193.

Bronchiectasis Following Atelectasis in Tuberculosis of Infancy: Role Played by Enlarged Glands and Granulation Tissue. J. G. Hughes and W. L. Simpson, Memphis, Tenn.—p. 197.

*Hypertension in Diphtheria. I. Rosenbaum Jr., Louisville, Ky.—p. 210.

Diphtheria Treated with Sulfanilamide: Report of Case. H. D. Bowman, Hagerstown, Md.—p. 218.

Treatment of Meningitis Due to Haemophilus Influenzae (Pfeiffer's Bacillus): Review of 108 Cases. J. W. Lindsay, E. C. Rice and M. A. Selinger, Washington, D. C.—p. 220.

Influenzal Meningitis: Case Report. E. M. Sirlin, Mishawaka, Ind., and A. H. London, Durham, N. C.—p. 228.

Ten "Good" Eaters and Ten "Poor" Eaters: Developmental Background and Behavior Relevant to Nutrition and Health of Group of Nursery School Children. Jeanette B. McCay and Helen D. Bull, Ithaca, N. Y.—p. 230.

The Child's History as Aid in Psychiatric Treatment of Children. G. H. J. Pearson, Philadelphia.—p. 241.

Nervous System in Sickle Cell Anemia.—Hughes and his collaborators present six cases of sickle cell anemia with cerebral complications, review the literature and discuss the pathologic changes. From the records of their cases and from twenty-five culled from the literature it seems that neurologic manifestations are frequent, the lesions are multiple and the location of the lesions is variable. The onset of symptoms is often sudden and extensive enough to cause grave manifestations such as convulsions, meningeal signs, pains, aphasia, paralyses, coma and death. The prognosis following central nervous system lesions is poor, varies widely and is unpredictable. Frequently there are patients who have recurrent episodes in whom the symptoms and signs are referable to the nervous system. In these cases there is a tendency for the later attacks to be more severe. The cerebrospinal fluid observations are variable and often normal, although the patient has definite neurologic signs. Fluids which on first examination were normal may later become abnormal. The abnormalities of the cerebrospinal fluid consist of increased pressure, sickled erythrocytes, xanthochromia and protein and leukocyte increases. The cerebral lesions are varied and widespread. It is the authors' opinion that the central nervous system lesions are primarily intravascular. The most common changes found at necropsy are dilatation of peripheral blood vessels and congestion with sickled erythrocytes. Multiple thrombosis of smaller blood vessels in the same area is the rule. Other vascular lesions in the small vessels include infiltrative and degenerative changes in the vessel walls, perivascular edema, cellular exudation, hemorrhage and necrosis. The changes in the larger arteries and arterioles include intimal proliferation, fragmentation and reduplication of the intima, medial fibrosis and hyalinization, and sometimes hemorrhage into the media, with pigmentary changes and calcification. The cortical and convolutional gray matter and to a less extent the white matter adjacent to it are involved. The spinal cord has been studied inadequately, but the meager evidence available reveals meningeal and vascular lesions and degenerative changes in ganglion cells comparable to those found in the cerebral cortex. The presence of elongated and multipointed sickled erythrocytes, the increase of leukocytes, nucleated red blood cells, macrocytes and platelets and in some cases venous back pressure due to obliterative changes in the arterioles of the lung and myocardial failure increase the normally slow blood flow through the small vascular channels of the cortex. The arterial changes are interpreted as being secondary to capillary and venous thrombosis. The pathologic observations correlate well with the clinical manifestations. The milder symptoms (headache, drowsiness, dizziness, minor meningeal irritation and temporary sensory and motor symptoms and signs) are probably explainable on the basis of vascular stasis and small thrombi with good collateral circulation. Confusion psychoses, mental changes, convulsions, aphasia, hemiplegia, paresthesias, delirium and coma may occur with more extensive lesions. Dilated vessels, occasional hemorrhages, edema of the fundi, localized facial swelling, dilated and thickened and tortuous temporal vessels, bulging fontanels and relief of headache following epistaxis indicate that cerebral stasis is present. The severe joint and osseous pains complained of commonly are probably due to vascular lesions, inflammatory reaction and irritation of nerve endings in these tissues. Some severe back pains and neck stiffness interpreted as meningeal may be articular in origin or due to lesions in tendons and muscles. Some severe chest and abdominal pains and pains in the skin and extremities are probably referred pains which are primary in the central nervous system or spinal ganglions. There is no specific therapy.

Hypertension in Diphtheria.—Rosenbaum reports two cases of hypertension occurring in the course of postdiphtheritic paralysis. The blood pressure increased as the paralysis progressed and gradually decreased as the paralysis cleared. Von Kiss was the first to observe hypertension in uncomplicated cases of diphtheria. He also reported an elevation of blood pressure in four of six fatal cases of postdiphtheritic paralysis. Clinical and electrocardiographic signs of severe cardiac damage were present in all the patients. They died with symptoms of cardiac failure, and at necropsy degeneration of cardiac muscle was demonstrated. There has been much speculation concerning the etiology of blood pressure changes in diphtheria. On the basis of their animal experiments Romberg, Passler, Bruhns and Muller believed that in the acute phase of diphtheria the cause of death lay in paralysis of the vasomotor center in the medulla, with a consequent fall in blood pressure. They claimed that vasomotor paralysis, not myocardial weakness, was the chief cause of circulatory failure. According to this concept hypotension is due to toxic injury to the vasomotor center, and hypertension is caused by its stimulation. The explanation of hypertension through increased cerebral pressure and consequent marked compression of the medullary centers would be completely understandable. The experiments of Friedemann, who found increased spinal fluid pressure without increased protein or cells as a constant symptom in severe diphtheria, support this concept. However, Von Kiss and Horanyi were unable to demonstrate anatomic changes in the vasomotor centers. They felt that the vegetative nervous system of human beings, guinea pigs and horses did not have affinity for diphtheria toxin. Attempts to correlate the pathologic urinary changes in some cases of diphtheria with changes in blood pressure have shown no relationship. Rosenbaum believes that in these cases a neurologic etiology would seem most tenable. He cites three cases reported by Salus. In the two patients who survived, the hypertension, marked lability of pressure, tachycardia and increased respirations came on with the ascending paralysis when the bulbar symptoms appeared, and they gradually cleared as the paralysis improved. Muller and Nordmann encountered a similar case in which a lesion was found in the substantia reticularis grisea to which the hypertension was attributed. The author says that these cases of paralysis with hypertension bear a striking resemblance to his two cases

of postdiphtheritic paralysis. In all of them the symptoms of hypertension came on at the same time as the paralysis and gradually cleared as the paralysis improved. As all these patients showed either hypoglossal or vagal paralysis, the hypertension might be due to irritation of the neighboring glossopharyngeal nerve, such as is seen in glossopharyngeal neuralgia. This reflex is mediated through the carotid sinus.

Journal of Pharmacology & Exper. Therap., Baltimore

69:273-384 (Aug.) 1940. **Partial Index**

Pulmonary and Urinary Excretion of Paraldehyde in Normal Dogs and in Dogs with Liver Damage. H. Levine, A. J. Gilbert and M. Bodansky, Galveston, Texas.—p. 316.

Action of Synthetic Antispasmodics "Trasentin" and "Trasentin-6H." J. D. P. Graham and S. Lazarus, Glasgow, Scotland.—p. 331.

Toxicity, Treponemicidal Activity and Potential Therapeutic Utility of Substituted Phenylarsenoxides: I. Methods of Assay. H. Eagle, Baltimore.—p. 342.

Chemotherapy of Experimental Hemolytic Streptococcus Infections with Gold Salts. M. H. Dawson and Gladys L. Hobby, New York.—p. 359.

Absorption and Excretion of Sulfapyridine and of Sodium Sulfapyridine in Man. H. D. Ratish, A. Davidson and J. G. M. Bullowa, New York.—p. 365.

Journal of Thoracic Surgery, St. Louis

9:583-700 (Aug.) 1940

Sulfanilamide and Experimental Tuberculosis in Guinea Pig. H. C. Ballon, A. Guernon and M. A. Simon, Montreal.—p. 584.

Pedicled Muscle Flap in Treatment of Bronchial Fistulas: Report of Sixteen Cases. C. Crafoord and P. Linton, Stockholm, Sweden.—p. 606.

Neurofibromatosis with Sarcomas in Lungs. M. Louria, M. Lederer and Liselotte Herz, Brooklyn.—p. 612.

Evaluation of Pulmonary Function Tests in Determination of Risk Prior to Thoracic Surgery. R. Adams, Boston.—p. 623.

*Thoracoplasty in Treatment of Pulmonary Tuberculosis: Review of 100 Consecutive Cases. A. F. Miller, V. D. Schaffner and J. E. Hiltz, Kentville, Nova Scotia.—p. 634.

Renal Failure as Complication of Cardiac Tamponade: Report of Case. E. S. Stafford, Baltimore.—p. 652.

Mechanical Aids to Collapse Therapy. W. H. Oatway Jr. and J. W. Gale, Madison, Wis.—p. 656.

Anomalies of Lungs, with Special Reference to Danger of Abnormal Vessels in Lobectomy. H. A. Harris, Cambridge, England, and I. Lewis, London, England.—p. 666.

Fibroma of Esophagus: Report of Case. N. R. Barrett, London, England.—p. 672.

Diffuse Polypoid Laryngotracheobronchitis: Preliminary Note on Endoscopic Curettage. P. C. Samson, Oakland, Calif.—p. 679.

Situs Inversus, Sinusitis and Bronchiectasis. D. B. Cole and W. L. Nalls, Richmond, Va.—p. 689.

Thoracoplasty for Pulmonary Tuberculosis.—Miller and his colleagues discuss their experience with 245 thoracoplasty stages or operations necessary for 100 consecutive patients with parenchymal disease. There were twenty-six cases complicated by tuberculous empyema and two by a persisting pleurisy with effusion. One was an oleothorax case and one a pneumothorax which would not reexpand. Seventy-five per cent of the patients operated on were between 20 and 40 years of age. Only thirty-five of the cases were strictly unilateral, while sixty-five presented bilateral disease; twenty-one required contralateral collapse procedures. The disease was moderately advanced in only 20 per cent of the patients. Thoracoplasty was performed on the right side in forty-four cases and on the left side in the remainder. The disease was predominantly exudative on the operative side in 25, exudative and productive in 70 and productive in 5 per cent. In sixty-five cases the disease was present in the opposite lung. Cavitation was present in eighty-three of the 100 cases, confined to one lobe in seventy-eight. Complete closure was effected in sixty-four of the eighty-three cases. The results of thoracoplasty indicate that contralateral disease is no contraindication to thoracoplasty, provided it is not extensive or unstable or that it is brought under control by some form of collapse. There was little or no difference in the ultimate result whether the disease was contralateral or not; 85 per cent of both classes showed definite improvement, whereas 50.8 per cent of the former and 43 per cent of the latter were apparently arrested or apparently cured. Contralateral compression should be considered as a means of preparing serious cases with bilateral disease for thoracoplasty operation. Thoracoplasty should not be instituted only as a last chance measure but should be considered for good risk patients, when the disease is unilateral or at most slight in amount and well fibrosed in the contralateral lung. In good risk patients the disease is inactive and the patient's general condition is good. The smaller cavities were more easily and more frequently closed than the larger ones, which also holds true in other forms of collapse therapy. The likelihood of complete closure is greater in the thinner walled cavities. A good mechanical result does not always mean that the patient is free of symptoms or bacilli. However, none of the patients with good mechanical results (73 per cent) have died. The ones that were not cured or arrested were converted from a state of "poor chronicity" to one of "good chronicity" or with the passage of time they may be cured. On the whole, the patients with cavities did better than those with no cavities, with the exception of the mortality rate. If the empyema cases are eliminated, the noncavity cases lead by a good majority. The results were slightly better among patients with negative sputum, but so little better that it is somewhat surprising. The chance of a good mechanical result was lessened, as was also the chance of a good clinical result, as the delay between operative stages lengthened. The usual interval between operations was two weeks. Practically as good results were obtained among the older cases as in those of shorter duration. However, the best results were obtained in those patients whose disease existed for less than a year. There were eleven deaths, and only six were classified as operative deaths. Contralateral spread of the infection occurred in fifteen patients and wound infection in five; other mild or serious complications occurred in thirteen. The authors hope that, now that spinal anesthesia is being used rather extensively, the number of spreads will be reduced materially. The cause of spread, they believe, is usually due to failure to cough up secretions immediately after operation, with resultant pooling in the opposite lung. Thoracoplasty has left something to be desired, as only nine patients can be classified as cured, forty as arrested and thirty-six as improved. Only four were not improved by operation, and as eleven died the operation was unsatisfactory in fifteen.

Kentucky Medical Journal, Bowling Green

38:363-422 (Sept.) 1940

Common Sense in Handling Behavior Problems of Childhood. A. J. Alexander, Lexington.—p. 412.

Anemia as a Public Health Problem. H. Gordon, Louisville.—p. 415.

Rosacea-like Tuberculid of Lewandowsky. W. U. Rutledge, Louisville.—p. 417.

Laryngoscope, St. Louis

50:703-796 (Aug.) 1940

Rhinology in Children: Résumé of and Comments on Literature for 1939. D. E. S. Wishart, Toronto.—p. 703.

Impaired Hearing in School Children. S. R. Guild, L. M. Polvogt, H. R. Sandstead, W. E. Loch, Ella Langer, Mary H. Robbins and W. A. Parr, Baltimore.—p. 731.

Clarification of Certain Phases of Physiology of Hearing. H. Davis, Boston.—p. 747.

Clinical Objectives in Chemotherapy of Hemolytic Streptococcus Infections. C. Lyons and R. N. Ganz, Boston.—p. 756.

New Amplifier Having Characteristics Similar to Those of Human Ear, and Its Application to the Problem of Deafness. F. H. Shepard Jr., Merchantville, N. J.—p. 767.

Treatment of Deafness. L. K. Guggenheim, West Los Angeles, Calif.—p. 773.

Cresatin in Laryngology and Otology. M. D. Lederman, New York.—p. 784.

Nebraska State Medical Journal, Lincoln

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Clinical and Roentgenologic Manifestations of Low Back Pain. I. H. Lockwood, Kansas City, Mo.—p. 321.

Diseases of Right Upper Quadrant of Abdomen. A. F. Tyler, Omaha.—p. 327.

Importance of Adequate Treatment of Fractures of Foot. J. E. M. Thomson, Lincoln.—p. 331.

Exogastric Pedunculated Myosarcoma of Stomach. O. R. Platt, G. F. Waltemath and J. H. Millhouse, North Platte.—p. 336.

Acute Appendicitis. J. D. Bradley, Pender.—p. 338.

Sacrococcygeal Chordoma: Case Report. W. F. Bowers, Omaha.—p. 341.

Pulmonary Embolism from Superficial Vein Thrombosis. C. Frandsen, Omaha.—p. 343.

New England Journal of Medicine, Boston

223:265-306 (Aug. 22) 1940

Is Thiamine the Antineuritic Vitamin? A. P. Meiklejohn, Boston.—p. 265.
*Observations on Pruritus Ani. G. S. Speare and R. E. Mabrey, Boston.—p. 274.
*Treatment of Gonococcic Infection in Women: Comparison of Results With and Without Sulfanilamide Therapy. W. M. Brunet, J. B. Salberg and R. A. Koch, Chicago.—p. 277.
Treatment of Arthritides of Known Origin. W. Bauer and C. L. Short, Boston.—p. 286.

Observations on Pruritus Ani.—Speare and Mabrey discuss the various treatments tried in 175 cases of pruritus ani encountered during the last four years at the Rectal Clinic of the Massachusetts General Hospital. The age of the patients varied from 18 to 80 years. There was only one patient less than 20 years of age, while the third, fourth, fifth and sixth decades were about equally represented. The ratio of men to women was almost 2:1. The reason for this is probably the more scrupulous hygiene that women employ after defecation. The duration of symptoms varied from one week to thirty years. Local disease, which consisted chiefly of internal hemorrhoids and external skin tags, was present among 40 per cent of the patients. Cutaneous itching in other parts of the body was complained of by nineteen of the 175 patients. There is no specific treatment for pruritus ani, and therefore every patient should be treated individually by one method or a combination of several methods. Scrupulous hygiene is of paramount importance. This includes washing with soap and warm water after every defecation, and thorough drying without excessive rubbing. Various soothing, astringent, antiseptic, keratolytic or antipruritic topical medicaments were used. Most patients respond to one or another of these. Many simple early cases can be cured with nothing more than careful hygiene. Acute stages of erythema, excoriation and vesication without chronic cutaneous changes can be made to disappear in one or two weeks by the daily application of tincture of metaphen. Even patients with signs of an acute dermatitis superimposed on chronic cutaneous changes should be so treated. For chronic cases showing thickening and cutaneous discoloration without superimposed acute irritation, keratolytic and antipruritic ointments should be used. The application of salicylic acid and sulfur ointment is effective. Scrupulous hygiene and continued use of this or a similar ointment may bring about permanent improvement. When all simple treatments fail some form of subcutaneous injection is resorted to in order to interrupt the afferent sensory pathways. Forty-eight patients required injection treatment. For eighteen a solution containing quinine and urea hydrochloride and procaine hydrochloride was used, an oil-soluble anesthetic for sixteen and alcohol for fourteen. Injection treatment should not be carried out in the presence of acute exacerbations. Of the injection measures 70 per cent alcohol injected subcutaneously gave the best results. Roentgen therapy was used for four patients; one obtained relief for seven weeks, one for three weeks, one had no relief and one had partial relief for a year.

Treatment of Gonococcic Infection in Women.—Brunet and his associates compare the results of 241 gonorrheal infections in women treated with silver proteinate instillation and local treatment with the results among 241 similar cases in which sulfanilamide and local treatment were given. The study shows that the latter management halves the distressing pelvic complications and reduces the treatment period by a third. There was an increase in the number of abscesses of Bartholin's gland, but the authors can give no satisfactory explanation for this finding. The reactions to sulfanilamide were numerous but usually of a minor nature. Seventeen per cent of the patients were unable to take 40 grains (2.6 Gm.) of the drug without disturbing reactions. However, the patients who were able to take only 20 grains (1.3 Gm.) of sulfanilamide daily made almost parallel progress with those taking larger doses. The authors have no satisfactory explanation for this observation, unless the concentration of the drug in the blood does not have the significance previously attributed to it in relation to the control and cure of gonorrhea.

North Carolina Medical Journal, Winston-Salem

1:371-462 (Aug.) 1940

Sprue in North Carolina. F. M. Hanes, Durham.—p. 371.
Thoracoplasty with Apicolysis. C. R. Monroe, Pinehurst; C. D. Thomas and C. L. Gray, Sanatorium.—p. 375.
Gout. H. C. Thompson, Shelby.—p. 379.
Acute Disseminated Encephalomyelitis. E. A. MacMillan, Winston-Salem.—p. 382.

Public Health Reports, Washington, D. C.

55:1419-1472 (Aug. 9) 1940

Incidence of Cancer in Pittsburgh and Allegheny County, Pennsylvania, 1937. A. J. McDowell.—p. 1419.

55:1473-1516 (Aug. 16) 1940

Evaluation of Mouse Test for Standardization of Immunizing Power of Antirabies Vaccines. K. Habel.—p. 1473.
*Helium-Oxygen Mixtures for Alleviation of Tubal and Sinus Block in Compressed Air Workers. J. W. Crosson, R. R. Jones and R. R. Sayers.—p. 1487.
Two Epizootics of Plague Infection in Wild Rodents in the Western United States in 1938. L. B. Byington.—p. 1496.

Helium-Oxygen Mixtures for Tubal and Sinus Block.—Crosson and his co-workers encountered in a course of a field study on compressed air illness a by-product, namely ear block or tubal and sinus block. Helium-oxygen mixtures are a means for its relief. This subjective complaint of pain or discomfort in the ears is a distinct entity encountered in compressed air work and is entirely separate from compressed air illness. Armstrong and Heim observed the same condition in aircraft pilots. In compressed air workers the condition may advance to a frank otitis media if the block is not relieved promptly. The ears may not be involved, but an obstruction of one or more of the ostiums of the accessory nasal sinuses may produce severe pain in the area of the affected sinus. The only objective sign in sinus block may be slight nasal bleeding. If relief is not afforded, the pain continues and an acute sinusitis is likely to develop. Tubal and sinus blocks are most commonly encountered in workers with infection of the upper part of the respiratory tract. In "locking in" the compressed air worker must consciously or unconsciously continuously equalize the pressure in his accessory sinuses and middle ear. Many workers swallow while locking in, but the majority use the Valsalva method, closing the nose and mouth tightly and attempting to expire forcefully, thus increasing the pressure in the pharynx and forcing air up to the middle ear by way of the eustachian canal. If one man of a gang acquires a "block," the inrushing air must be shut off at once and the pressure lowered. Then a second try is made and, if not successful this time, the worker must leave the lock. This fluctuation of the pressure often precipitates a "block" in one or more men of the gang attempting recompression after the first worker has been "locked out." Oftentimes, rather than lose a shift or be ridiculed by his mates, a worker will "force himself through," by enduring the pain and discomfort in the hope that it will soon right itself. These are the cases in which otitis media, often with subsequent suppuration, and rupture of the ear drum are more prone to develop. If the worker reports to the physician on duty, a series of shrinking solutions will be placed far back in his nose and throat, which may or may not be efficacious in breaking the block. A method of eliminating these conditions with helium was tried out. A helium-oxygen mixture should diffuse through an accessory nasal sinus ostium or the eustachian tube more rapidly than would the nitrogen of air. Thus the equalization of pressure between the middle ear and the external barometric pressure should occur more readily. A simple apparatus was designed by the United States Bureau of Mines Laboratories which could be used by the worker in the man lock. It consists of a small cylinder of 80 per cent helium and 20 per cent oxygen connected through a small reducing valve to a "lung" or breathing bag. The breathing bag is equipped with an admission valve, and attached to it is a rubber tube with a detachable face mask. The whole apparatus is no larger than a small suitcase and can be left permanently in the man lock in charge of the lock tender. The apparatus is automatic and ready for instant use. The affected worker applies the mask and breathes normally for one minute or more and usually the "block" is broken. He can then go on through either still using the mask or not as necessity demands. The authors believe

that this procedure should save considerable time for the worker and the employer and obviate the danger and discomfort of the disabling tubal or sinus block. The use of this apparatus in the man lock is strongly urged in order to prevent the occurrence of the more serious complications of "block" and also as it will obviate the necessity of fluctuation of pressure which frequently precipitates a "block" in one or more men attempting recompression after the first worker has been "locked out."

Southwestern Medicine, El Paso, Texas

24:253-286 (Aug.) 1940

Practical Procedure in Treatment of Fistulas of Small Intestine. H. G. Williams and W. O. Sweek, Phoenix, Ariz.—p. 253.
Cancer of Stomach. J. S. Horsley, Richmond, Va.—p. 256.
Present Status of Treatment of Urinary Infections. H. C. Bumpus Jr., Pasadena, Calif.—p. 261.
Further Notes on Clinical Aspects of Ultra Short Wave X-Ray. A. Soiland, Los Angeles.—p. 264.

Surgery, St. Louis

8:169-408 (Aug.) 1940. **Partial Index**

William James Mayo (1861-1939) and Charles Horace Mayo (1865-1939). D. C. Balfour, Rochester, Minn.—p. 170.
A Personal Appreciation of the Mayos and Their Work. J. M. T. Finney, Baltimore.—p. 176.
The Mayos and Their Work. G. Crile, Cleveland.—p. 179.
Public Opinion and Animal Experimentation. E. C. Cutler, Boston.—p. 182.
Surgical Management of Usual Extrahepatic Biliary Lesions. A. W. Allen, Boston.—p. 188.
*Indications and Results of Pancreatectomy for Hypoglycemia. V. C. David, Chicago.—p. 212.
Portal Circulation and Restoration of Liver After Partial Removal. F. C. Mann, Rochester, Minn.—p. 225.
*With How Little Lung Tissue Is Life Compatible? Report of Patient from Whom All Pulmonary Tissue Except Two Upper Lobes Was Successfully Removed. E. A. Graham, St. Louis.—p. 239.
Surgical Treatment of Primary Duodenal Diverticula. J. J. Morton, Rochester, N. Y.—p. 265.
Problem of Surgical Arrest of Massive Hemorrhage in Duodenal Ulcer: Technic of Closing Duodenum. O. H. Wangensteen, Minneapolis.—p. 275.
Use of Miller-Abbott Tube in Surgery of Large Bowel. A. O. Whipple, New York.—p. 289.
Regional Lymphatic Metastasis of Carcinoma of Rectum. F. A. Coller, E. B. Kay and R. S. MacIntyre, Ann Arbor, Mich.—p. 294.
Use of Rectus Fascia for Closure of Lower or Critical Angle of Wound in Repair of Inguinal Hernia. W. F. Rienhoff Jr., Baltimore.—p. 326.
Current Treatment of Cancer of Lip: Clinical Speculation. V. P. Blair and L. T. Byars, St. Louis.—p. 340.
Arteriosclerosis in Pancreatic Diabetes. L. R. Dragstedt, D. E. Clark, O. C. Julian, C. Vermeulen and W. C. Goodpasture, Chicago.—p. 353.
Progressive Lymphedema Associated with Recurrent Erysipeloid Infections. A. Ochsner, A. B. Longacre and S. D. Murray, New Orleans.—p. 383.

Pancreatectomy for Hypoglycemia.—David discusses the advisability of partial or subtotal resection of the pancreas for hypoglycemia when no neoplasm is found in the part removed. Of eighteen partial resections (from 14 to 28 Gm.) with no tumor, the pancreas of fifteen patients was normal histologically and in three hyperplasia of the islet cells was present. The minimal blood sugar in this group was below 50 mg. per hundred cubic centimeters in fourteen patients. Of fourteen surviving patients only three were free from attacks, three were moderately improved and the attacks of eight continued. Seventeen other patients have had from 35 to 60 Gm. of pancreas removed for spontaneous hypoglycemia. No tumor was found in the resected tissue in these patients. The examination of the pancreatic tissue revealed fourteen normal pancreases, hyperplasia of the islet cells in two and a pancreatitis in one. Eleven of these patients are relieved of the symptoms of hypoglycemia. Seven have been followed for more than two years. There was only one operative death. Of the four unimproved patients, two had a fasting blood sugar of from 65 to 70 mg. per hundred cubic centimeters before the operation and therefore may not strictly belong to the group giving the characteristic Whipple triad of symptoms (attacks of nervous or gastrointestinal disturbances coming on in a fasting state, a hypoglycemia with readings below 50 mg. and immediate relief from the ingestion of dextrose). The author concludes that exploration of the pancreas is indicated in patients with this triad of symptoms in whom extrapancreatic causes of hypoglycemia have been excluded and dietary management has failed. Subtotal resection of the tail and body of the pancreas up to the superior mesenteric vessels is indicated when exploration reveals no tumor. This operation should be a part of the treatment of spontaneous hypoglycemia until more knowledge of the underlying causes of the condition offers a better solution of the problem.

Lung Tissue Necessary for Life.—Graham reports the removal from a boy of 14, because of bronchiectasis, the two lower lobes, the right middle lobes and the lingula of the left upper lobe. It is generally accepted that the lingula is the homologue of the right middle lobe. Therefore the case represents the removal of four of the six lobes and, according to the literature, is the most extreme example of successful radical removal of pulmonary tissue. Although only two months has elapsed since the completion of the second operation, the boy is able to walk rapidly for short distances without dyspnea and his vital capacity is 1,200 cc. Continued improvement and increase in vital capacity are expected. After the first operation, on the right side the boy's expectoration was decreased by one half and cough was confined to mornings and evenings. Since the second operation there has been no cough or sputum and severe clubbing of the fingers has disappeared. The patient's productive cough followed an attack of pneumonia at the age of 2½ and continued until the second operation, after which there has been no cough or sputum.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Bol. de la Soc. Cubana de Pediatría, Havana

12:309-354 (Aug.) 1940

*Erythema Nodosum and Tuberculosis in Children. A. Silva.—p. 309.
Curative Effect of Massive Doses of Sulfapyridine in Purulent Hemophilus Influenzal Meningitis: Case. A. Castellanos, E. Galán and F. Hernández Calzadilla.—p. 322.
Hemophilus Influenzal Meningitis Followed by Klebsiella Meningitis: Case. A. Escobar.—p. 341.
Hemophilus Influenzal Meningitis Cured by Sulfathiazole: Case. A. J. Aballí.—p. 349.

Erythema Nodosum.—Erythema nodosum, according to Silva, is now preponderantly regarded as of tuberculous origin. The various criteria employed to determine tuberculous infection—a contaminated environment, positive tuberculin tests, roentgenograms, the detection of bacilli in the nodules and blood and the examination of the gastric contents during fasting—combine to yield corroborative evidence. In one of his eight cases (age level from 11 months to 8 years) the positive Mantoux reaction was delayed for three weeks. The author thinks that x-ray examinations should be regularly performed because of the frequent involvement of lymph node and pulmonary tissue even if the physical examination remains negative. The type of lesion usually found is an epituberculosis, a serofibrinous leukocytic inflammatory reaction occurring about the focus of the tuberculous infection. The prognosis is quite benign. A full bibliography is presented.

Medicina, Mexico City

20:419-442 (Aug. 25) 1940

*Significance of Asymptomatic Renal Calculus in Anemia. R. Gutiérrez.—p. 419.
Necessity of Pharmacodynamic Study of Mexican Plants. E. C. del Pozo.—p. 438.

Anemia Due to Unsuspected Renal Calculus.—Gutiérrez discusses the etiology of asymptomatic kidney stone, the pathogenesis of secondary anemia and the patient's amelioration following nephrolithotomy, in some cases with complete recovery from anemia and from gastrointestinal symptoms. Case histories, of which seven (age level from 23 to 58) are selected for comment, showed common symptoms and signs of anemia, such as loss of appetite, weight and vigor, gastrointestinal disorders, fatigability, abnormal blood picture and the total failure of antianemic medication, however long sustained, to improve the patient's condition, in the absence of correct diagnosis and surgical intervention. Latent renal concretions, though persisting for years, may remain completely undetected until necropsy. The absence of symptoms, negative results in routine urine examinations, even when one of the kidneys is completely blocked, and negative roentgenograms in the presence of radiotransparent calculi contribute to confuse diagnosis. Some latent calculi can ultimately be determined only by retrograde pyelographic tests. The author reviews the various factors productive

of kidney stone. The degree of severity of secondary anemia depends on the extension, site and duration of the calculus as well as on the type of pathogenic organism involved. Frequently renal calculus is associated with tumor or renal tuberculosis. Most calculi are found in patients with alkaline urine. So-called idiopathic anemia may be due to calculus and its secondary character completely mistaken. The presence of "staghorn calculus" points to a long history of stone formation. The author believes that patients with refractory anemia should be subjected to full urographic examinations. Anemia due to nephrolithiasis is scantily treated in the literature.

Revista Med.-Cir. do Brasil, Rio de Janeiro

48:421-480 (July) 1940. **Partial Index**

*Perforating Cholecystitis. V. de Angelis.—p. 445.
Preoperative and Postoperative Mental Reactions. Y. dos Guaranys.—p. 463.

Perforating Cholecystitis.—De Angelis reports eight cases of cholecystitis with perforation into the peritoneal cavity. The patients were between the ages of 27 and 30 years, except one, who was over 40. He states that the most frequent cause of this type of perforation is lithiasis and infection of the bile tracts with bacteria of the typhoid or coli groups. The symptoms are those of acute inflammation of the right side of the abdomen from rupture of a hollow viscus. The earlier the operation, the better the prognosis. Peritonitis develops with such rapidity that the majority of the patients are seen in the course of a more or less acute peritonitis. A preoperative diagnosis of rupture can be made from the seat of the lesion, as indicated by the localization of pain and muscle spasm over the gallbladder area, verified by pneumoperitoneum. The treatment consists in cholecystectomy with subhepatic drainage. The author prefers general anesthesia with nitrous oxide or cyclopropane to ether. The latter causes diminution in the secretion of bile. Lack of the flow of bile from the perforation may cause one to overlook the perforation with later effusion of bile taking place into the peritoneal cavity. Cholecystectomy with subhepatic drainage is indicated in obvious perforation of the gallbladder with bile in the peritoneum as well as in spontaneously closed perforation. Cholecystectomy is indicated even in the presence of sterile cultures from bile effusion, since the fluid may become infected later. Cholecystostomy with drainage in cases of spontaneously closed perforation is dangerous, as it may give rise to recurrent perforation.

Novyy Khirurgicheskiy Arkhiv, Dnepropetrovsk

46:99-192 (No. 182) 1940. **Partial Index**

Skin Incision. I. M. Faerman.—p. 99.
Traumatic Dislocations of Knee Joint. A. A. Konik.—p. 108.
Ligation of Femoral Vein and Brachial Vein for Gangrene of Extremities. A. A. Arkannikova.—p. 114.
Homoplastic Transplants of the Adrenal and the Ovary. M. G. Ruditskiy.—p. 120.
Precancerous Lesions of the Breast. A. Z. Kozdoba.—p. 135.
*Treatment of Suppurative Lesions with the Balsamic Pack of Vishnevskiy. V. I. Parmenov.—p. 143.
*Transfusion of Cold Conserved Blood. A. N. Glinskiy.—p. 151.

Suppurative Lesions.—Parmenov reports the results obtained in 251 cases of suppurating wounds treated with an ointment proposed by Vishnevskiy. The composition of the ointment is juniper tar 5 parts, bismuth tribromphenate 2 parts and castor oil 100 parts. The ointment appeared to be most effective in the acute, deep and extensive suppurations of soft tissues, such as one sees in perinephric abscess, pectoral phlegmon, intramuscular suppurations of the neck, buttocks or the hand. Rapid detoxification, abundant granulations and sharp decline in the amount of pus were observed as a rule in this group. The ointment was applied in cases of acute hematogenous osteomyelitis with good effect. In pyemia, local treatment with the "balsamic pack of Vishnevskiy" was combined with transfusions of small amounts of conserved blood. Observations in twelve cases of chronic varicose ulcers of the leg demonstrated that the ointment is of little if any effect in the treatment of superficial chronic ulcerating surfaces. The author adhered in the treatment of extensive wounds to the principle of wide exposure under anesthesia and careful and meticulous débridement, after which the wound was gently packed with tampons saturated with the balsamic ointment. No toxic effects on the kidney were noted. The packs are left undisturbed for from four to nine days depending on the extent and depth of the wound. The author attaches great importance to the immobilization of the suppurating focus in a plaster of paris cast. Physical therapy, streptocid (a sulfonamide), calcium, dextrose and methenamine and blood transfusions in grave cases were regularly employed. The author was impressed with the effect of the ointment on the general condition of the patients, the rapid fall in temperature, excellent granulations, rapid sloughing and healing of the wound. He considers the Vishnevskiy ointment superior in the treatment of extensive suppurations to the method of Carrel-Dakin.

Transfusion of Cold Conserved Blood.—Glinskiy failed to observe any alteration in the respiratory or cardiac function in animals following transfusion of cold conserved blood. He studied the effect on erythrocytes of warming blood conserved in a citrate solution. Portions of blood were warmed to 10 or 12 C., to 20 C. and to 30 and 40 C. Warming the blood to 12 and to 20 C. had no effect on the shape and on the osmotic resistance of the erythrocytes. In preparations of blood warmed to 30 and to 40 C. there were observed changes in the shape and the size of erythrocytes with the appearance of microcytes and shadows of erythrocytes and diminution in their osmotic resistance. The breaking down of the red cells under the influence of the warming up process proceeded parallel with the time of conservation of the blood. Beginning with January 1939 the author had performed 214 transfusions of conserved blood without resorting to warming. The temperature of the blood was from 10 to 12 C. In this group there were 26.1 per cent of clinically manifested reactions as contrasted with 38 per cent of reactions observed by the author in a previous group of 1,400 transfusions of blood which was warmed preliminary to transfusion. The author points out that the method of transfusing conserved blood without warming should be of particular significance in military practice.

Acta Radiologica, Stockholm

21:231-326 (June 15) 1940

"Uncovertebral Joints" and "Arthrosis Deformans Uncovertebralis." T. Krogdahl and O. Torgersen.—p. 231.
Free Gas in Abdomen as Sign of Perforation. H. G. Skarby.—p. 263.
Roentgenographic Symptoms of Meniscal Lesion in Knee Joint: Contribution to Question of Connection Between Meniscal Lesion and Arthrosis. K. Lindblom.—p. 274.
Ewing's Tumor in Lower Jaw: Two Cases. J. Nielsen.—p. 286.
*X-Ray Examination of Kidney Injuries with Special Regard to Intravenous Urography. I. Hareide.—p. 292.
Division of Lung Segments. E. Huizinga and E. Behr.—p. 314.

X-Ray Examination of Kidney Injuries.—Hareide points out that intravenous urography is indispensable in diagnosing kidney injuries and observing their anatomic nature. The roentgenogram and the urogram both give valuable information. The former enables one to recognize perirenal hematomas or an enlargement of the kidneys in case of subcapsular injuries. The latter gives information about the condition of the renal pelvis and about the respective functioning of the injured and uninjured kidney. The intravenous urogram is not as informative as the retrograde pyelogram but is sufficient as a rule to demonstrate the anatomic changes. Conclusions as to treatment drawn from roentgenologic observations should be compared with the clinical observations. Large perirenal hematomas do not indicate surgical intervention as they seldom endanger life. Likewise contrast mass outside the renal pelvis gives no indication for surgical intervention in case the extravasated urine lies in the kidney parenchyma. Should one observe, on the other hand, the contrast mass outside the kidney, the prospects of spontaneous cure are less encouraging. Cases without contrast mass excretion are the hardest to examine. There are roentgenologic signs that indicate whether the lack of secretion is due to a more or less serious cause. In case the kidney shadow is clear and of normal aspect the lack of secretion cannot be caused by a lesion of the renal artery or an extensive destruction of the renal tissue. The causative factor will most likely lie in the ureter in the form of an impediment to the flow of urine. If on the other hand the roentgenogram reveals a large retroperitoneal hemorrhage there is a possibility that the kidney has been destroyed. In such cases the clinical symptoms will decide whether immediate surgical intervention is necessary or whether one should wait and repeat urography later.